Annual Performance **Plan**
2015-18

nmisa
National Metrology Institute of South Africa
a member of the **dti**

Your measure of excellence

ABBREVIATIONS AND ACRONYMS

AFRIMETS	Intra-Africa Metrology System
BIPM	International Bureau of Weights and Measures
BRIC	Brazil, Russia, India and China
CAPEX	Capital Expenditure
CC	Consultative Committee
CEO	Chief Executive Officer
CGPM	General Conference on Weights and Measures
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
DDG	Deputy Director-General
DS	Dosimetry
EHS	Environment, Health and Safety
EM	Electricity and Magnetism
EXCO	Executive Committee
HR	Human Resources
ICT	Information and Communication Technology
IPAP	Industrial Policy Action Plan
IR	Ionising Radiation
ISO	International Standards Organisation
KCDB	Key Comparison Database
KPI	Key Performance Indicator
LED	Light Emitting Diode
MAT	Materials Characterisation Group
MEA	Multilateral Environment Agreements
MRA	Mutual Recognition Arrangement
MRL	Minimum Residue Levels
MTEF	Medium-Term Expenditure Framework
NEDLAC	National Economic Development and Labour Council
NMI	National Metrology Institute
The NMISA	National Metrology Institute of South Africa
NMS	National Measurement Standards
NTB	Non-Tariff Barriers
OEM	Original Equipment Manufacturer
OH&S	Occupational Health and Safety
OIML	International Organisation of Legal Metrology
PFMA	Public Finance Management Act
POP	Persistent Organic Pollutant
PPP	Purchasing Power Parity
PTS	Proficiency Testing Schemes
RMO	Regional Metrology Organisation
RS	Radioactivity Standards
R&D	Research and Development
SA	South Africa
SADC	Southern African Development Community
SADCMET	SADC Cooperation in Measurement Traceability
SANAS	South African National Accreditation System
SEDA	Small Enterprise Development Agency
SEM	Scanning Electron Microscope
SI	International System of Units
SKA	Square Kilometre Array
TBT	Technical Barrier to Trade
TC	Technical Committee
the dti	Department of Trade and Industry
TI	Technical Infrastructure
TID	Technical Infrastructure Development
VOIP	Voice Over Internet Protocol

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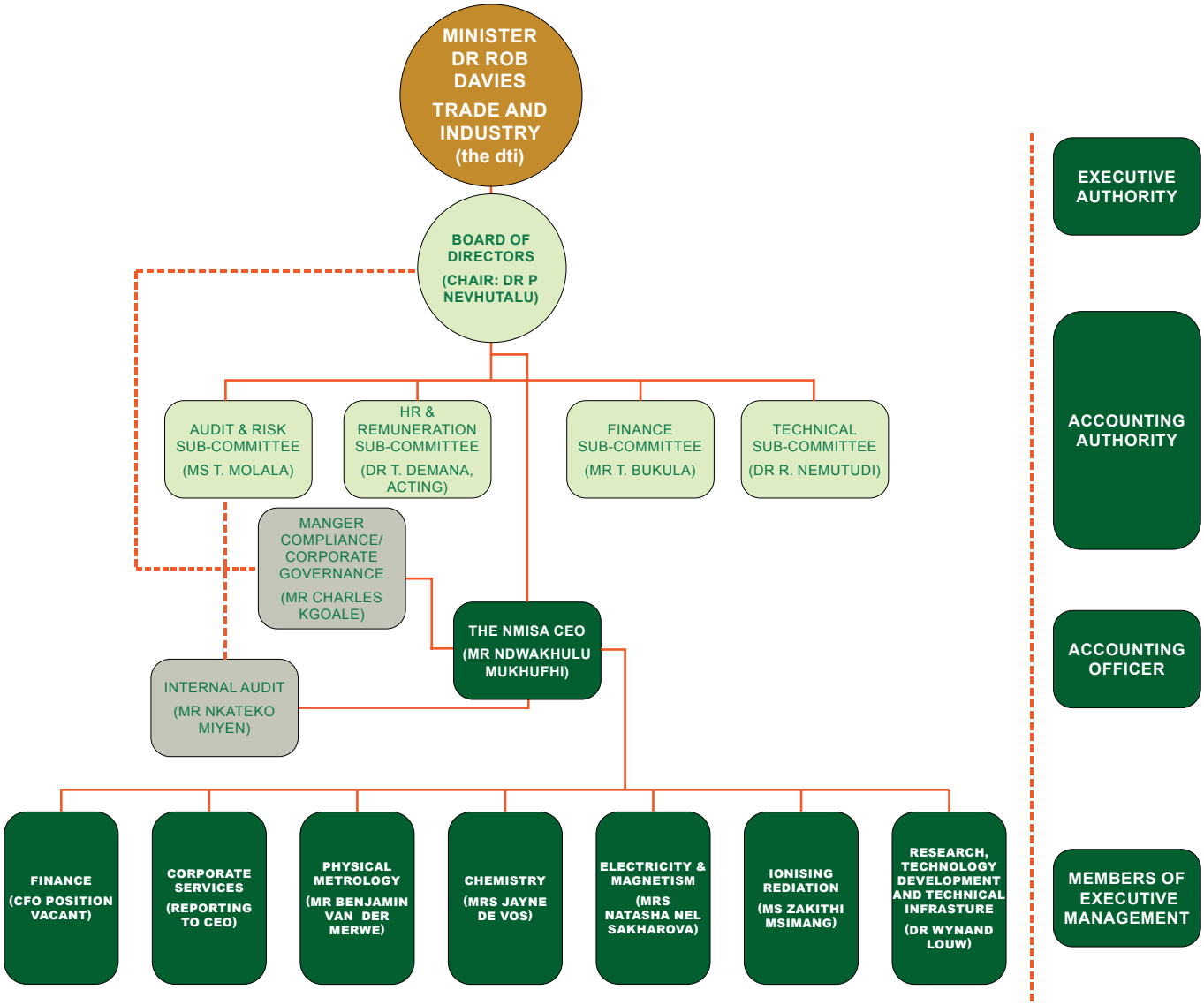
ORGANISATIONAL STRUCTURE

1. ORGANISATIONAL STRUCTURE

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



2. OFFICIAL SIGN-OFF

It is hereby certified that this Annual Performance Plan:

- was developed by the management of the NMISA under the guidance of the Board and the Board Chair, Dr Prins Nevhutalu;
- was prepared in line with the current Strategic Plan of the NMISA; and
- accurately reflects the performance targets that the NMISA will endeavour to achieve, given the resources made available in the budget for 2015/16 – 2017/18.

Mr Ndwakhulu Mukhufhi
Chief Executive Officer

Dr Prins Nevhutalu
Accounting Authority

.....

Dr Rob Davies
Executive Authority

3. FOREWORD BY THE MINISTER OF the dti

It is my pleasure to present the Annual Performance Plan of the National Metrology Institute of South Africa (the NMISA). As a technical infrastructure entity of **the dti**, the NMISA is mandated by the Measurement Units and Measurement Standards Act, 2006 (Act No. 18 of 2006), as the custodian of the National Measurement Standards for South Africa, ensuring that South African national standards and units are internationally comparable and scientifically valid. It is furthermore responsible for allowing the acceptance of export products and manufactured goods by overseas markets, locking out substandard and unsafe imports and ensuring proper analysis in healthcare and law enforcement.

Measurement forms the basis of international trade. Securing an export contract for trade commodities, for example, requires agreement on the mass and volume of the goods. Trade barriers occur when there is no agreement on the measurement and such barriers could be detrimental to enabling trade strategies, such as the Industrial Policy Action Plan (IPAP).

In IPAP, it is emphasised that the role of technical barriers to trade (TBTs) and non-tariff barriers (NTBs) is increasing the relative importance of technical infrastructure policies and institutions. Developed countries and advanced developing countries are increasingly using TBTs and NTBs to protect their markets. The NMISA is therefore pivotal in opening access to export markets, which has a direct impact on the job creation thrust of **the dti** and government.

The NMISA was successful in launching a major recapitalisation project that will see a leap in the technology used in the development and maintenance of the national measurement standards. This will contribute towards increasing its value proposition to industry and international markets. New and upgraded equipment and plans for a new building will see the institute grow substantially in coming years, and will entrench the NMISA's position as the authority in measurement standards. This will not only encourage local businesses to rely on NMSA's abilities, it will also assist them in being competitive and in securing access to international markets. A special focus on measurement standards will be directed at priority sectors, such as green industries, agro-processing, metal fabrication, as well as capital and transport equipment. With this in mind, I am particularly looking forward to the NMISA contributions to **the dti** deliverables and to the South African economy at large.

Dr Rob Davies
Executive Authority

4. OVERVIEW BY THE ACCOUNTING AUTHORITY

As a public entity institute, the NMISA serves the country and its population. The major objective of the NMISA is to link the national measurement system to the international measurement system and the NMISA continues to impact on the daily lives of all citizens, even at the level of informal settlements. The quality of drinking water, the monitoring of air pollution, food safety, healthcare and law enforcement all require the measurement foundation that the NMISA provides. At a higher level, accurate measurement is an essential tool for manufacturing, scientific research and technological innovation.

For the 2015/16 to 2017/18 period, the NMISA Board requested the NMISA Management to develop a special focus to assist, not only formal clients (calibration and analytical laboratories and large industries), but small, micro and medium enterprises (SMEs) as well. SMEs find it increasingly difficult to stay abreast of technical infrastructure requirements and developments (quality assurance and measurement in particular) and, in many cases, this constitutes the major factor preventing their success. Management responded and identified a need to assist especially the SMEs in the IPAP priority sectors, with an intervention in respect of measurements impacting on compliance with industry specifications, standards and legal requirements for enhanced competitiveness.

The formal sector and academia will benefit from the modernisation of the equipment of the NMISA, which will provide state-of-the-art measurement support for research and innovation. Other priorities, such as the development of nanotechnologies, biofuels, pharmaceuticals, environmental monitoring, energy efficiency and measurement to ensure food safety are also high on the agenda.

The NMISA will also contribute to human resources development in the science of measurement (metrology), by presenting special modules in metrology as part of higher education courses, providing training in measurement to industry and, in general, assisting the measurement community with measurement expertise.

It is within this context that the Board and Management of the NMISA present this Annual Performance Plan and commit themselves to the outputs and good governance that are necessary to deliver on the NMISA mandate.

PART A: STRATEGIC OVERVIEW

PART A: STRATEGIC OVERVIEW

5. VISION

To be a measurement centre of excellence, inspired to consistently deliver outstanding, innovative and international comparable measurement solutions that support the country's trade, people's quality of life and enable the protection of the environment.

6. MISSION

To provide South African industry and environmental, health and safety sectors with fit-for-purpose measurement standards and measurements. This is achieved by keeping and maintaining the national measurement standards and units to an acceptable international standard; and by disseminating traceability to the South African industry.

7. VALUES

- Measurement Excellence
- Social Responsibility
- Economic Prosperity
- Good Governance

8. STRATEGIC GOALS AND OBJECTIVES

The National Metrology Institute of South Africa (the NMISA) is guided overall by **seven goals**, namely:

Goal 1	Keep, maintain and develop the national measurement standards and provide for the use of the national measurement units
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 the 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 South African public and private enterprises through dissemination of the national measurement standards, units and expertise
Goal 7	Adhere to the regulatory requirements of a 3A public entity and sound corporate governance

The NMISA is guided overall by **twelve strategic objectives**; namely:

1	Provide for the national measurement units by maintaining the SI units, units outside the SI and equivalents of units
2	Maintain the Schedule of National Measurement Standards
3	Keep, maintain and develop measurement systems for bringing national measurement standards and reference methods into being
4	To ensure internationally recognised and comparable national measurement standards and units by participating in the Metre Convention, CIPM MRA and AFRIMETS activities
5	Establish confidence in the accuracy of the national measurement standards by suitable and documented quality and management system
6	To maintain the calibration and measurement capability (CMC) claims in KCDB as evidence of South Africa's measurement capability
7	Recapitalise and modernise the NMISA to ensure that the national measurement standards support international trade, health, environmental and safety requirements
8	As the foundation of the South African measurement system, provide technical measurement expertise and support for public policy objectives, accreditation, standardisation and regulatory affairs
9	To maintain and ensure continued expertise and establish the necessary skills according to internationally acceptable standards
10	Disseminate traceability, measurement expertise and services to the South African public and private enterprises by means of calibration, measurement or analysis and certified reference materials
11	Provide appropriate technology and skills transfer to the South African industry, especially to SMEs
12	Comply with government directives, the PFMA, treasury regulations and regulatory issues in terms of health, safety and the environment and apply good governance.

9. RECENT COURT RULINGS

None.

10. UPDATED SITUATIONAL ANALYSIS

Background

The NMISA was established in terms of the Measurement Units and Measurement Standards Act, 2006 (Act No. 18 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 standards (NMS) and units; and to provide for the keeping and maintenance of the NMS and units.

As the custodian of the national measurement units and NMS, the NMISA maintains and ensures the appropriate application of the International System of Units (SI) and other measurement units, as defined by the NMISA in consultation with the measurement community, for the country. The NMISA also keeps, maintains and disseminates the gazetted NMS. This role is performed via various products and services and is influenced by the external environment.

The goal of the National Industrial Policy Framework is to *"prevent industrial decline and support the growth and diversification of South Africa's manufacturing sector. Manufacturing drives growth and employment and can generate significant job creation directly as well as indirectly in a range of primary and service sector activities".*

The NMISA has a very specific role in this context. Competitive manufacturing relies on accurate, internationally comparable measurement that is achieved via the establishment of the "traceability" of the measurement result to the SI or internationally agreed references. In line with its mandate, the NMISA measurements link the national measurement system to the international measurement system and ensure its comparability with South Africa's main trading partners. This is achieved by establishing and maintaining the NMS, by comparing the NMS to those of other nations, by ensuring their comparability and by the dissemination of the NMS to local (and regional) trade and commerce. The NMISA also assists industry to successfully implement accurate measurement systems.

The trade of goods and services around the world is the lifeblood of the global economy and is becoming increasingly important to 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 need to be the equivalent of one another, as well as accepted by each other. Important decisions (economic, social and medical) are based on measurement results. The NMISA makes a contribution to all government key priorities and the 14 national outcomes and has aligned its key programmes to the IPAP priority sectors.

Without a measurement infrastructure, it is difficult to manufacture according to international specifications and tolerances, so as to ensure the integrity of export commodities. Measurement assists with the improvement of the competitiveness of the South African industry in support of the national strategic initiatives. As stated above, important decisions (economic, social and medical) are based on results of measurements. Measurements are part of people's daily lives and wrong or inaccurate measurement can result in losses, as well as disagreement between trading partners. It can also cause harm to people and the environment. South Africa's very survival depends on the ability to measure accurately. The list of potentially hazardous chemicals that people are exposed to (both naturally occurring and anthropogenic) is ever-increasing and the lack of analytical services to monitor these environmental toxins is impacting on South Africa's ability to provide comparable data that informs Government, who needs to address compliance issues that are becoming critical in trade negotiations, as well as technical barriers to trade (TBTs). Countries and trade regions impose regulations and directives with regard to trade goods, in order to protect the health of their people and the environment. Stricter legislation and the initiation of environmental programmes that directly impact on the South African people and South African trade are being applied globally.

Measurement underpins everything and, considered in its broadest sense, contributes to the general quality of life. The NMISA projects are in support of:

- monitoring greenhouse gasses with regard to clean air;
- protecting people against heavy metals and the effects of ionising radiation;
- assisting with accurate blood alcohol measurements;
- ensuring the accurate measurement of amino acids in food and biopharmaceuticals;
- determine contaminants in food and beverages to which people may be allergic;
- monitoring dioxins, pesticides and other contaminants in sediment, soil and water;
- assessing the purity of raw chemical substances to prevent harmful substances entering products; and
- the classification of biodegradable plastics to ensure correct labelling, recycling, etc.

The NMISA projects are also in support of seven of the twelve national outcomes:

- Quality of Life: (Improve the accuracy and reliability of chemical, physical and bio-measurements).
- Manufacturing and Industrial Development: (IPAP contribution and assistance to SMEs).
- Trade and Commerce: (Trade regulations rely on accurate measurements. The removal of TBTs).
- Safety and Security: (Ensure that safety regulations are met via accurate measurement; traceability to the regulatory domain (law enforcement), speed measurement, breath alcohol calibrations).
- Energy Saving and Green Industries: (Lighting sources consume about 20% of all electricity generated. Replacement of conventional lamps with LEDs will reduce the consumption to 16%).
- Environmental Protection: (Recent alerts in the EU regulations and stricter minimum residue levels (MRLs), once again highlighted the vulnerability of African economies due to inadequate analytical testing facilities. South Africa is a signatory to the POPs Convention and is therefore committed to establishing at least one centralised toxic substances analytical laboratory for higher order measurements).
- Food Safety: (Toxic elements and contaminants in food and food packaging – to meet EU regulations. Establishing capability for measuring nutritional elements and amino acids in infant formulae and wheat-based products is essential).

Contributions to IPAP, Quality of Life, Manufacturing and Industrial Development, Trade and Commerce, Safety and Security, Energy Saving and Green Energies, Environmental Protection, Food Safety, Information and Telecommunications and Regional Development are proactively supported by the technical divisions and guided overall by **seven strategic outcomes-orientated goals** that support the NMISA mandate, mission and vision and, which in a broader sense, contribute to the objectives of **the dti** and government's 12 national outcomes.

Recapitalisation

The NMISA's ability to develop new NMS and to maintain and/or improve the existing NMS to levels required by industry is under threat from an ageing infrastructure. This includes the NMS, as well as the building infrastructure.

The NMS and other standards are continually reviewed to ensure that they still meet the needs of the South African industry. This is done via engagement with industry and other stakeholders through technical advisory forums and participation in national interest forums. "*Typically, the accuracy required of national measurement standards doubles every ten years."* With doubling requirements, modern metrology laboratories need to be custom-built with advanced environmental control; clean power supplies; surgical grade clean rooms; and anti-vibration flooring. Infrastructure should further be designed and planned in such a way that it can be upgraded at regular intervals to meet the increasingly stringent environmental conditions and to stay abreast of technological developments in measurement sciences.

To successfully fulfil its mandate, the NMISA has to ensure that the equipment and facility infrastructure that support the NMS are maintained and conserved. This implies a continued investment in the required infrastructure.

> The measurement infrastructure in the country unfortunately did not keep up with modern developments and the export industry is increasingly faced with the inability of the local measurement system to provide the analyses and traceability required for exports.

With almost 50% of the equipment that defines the NMS being between 10 and 30 years old, in many cases the NMS cannot achieve the measurement levels that the South African industry requires. In the Chemistry Division,

the life-cycle of instruments is short, due to the rate at which technology changes internationally, as well as the rate at which allowable residue values of contaminants in foodstuffs and other products are being decreased. The measurement needs and tolerances of the fast-advancing ICT industry also increase exponentially. The result is that the equipment replacement strategy of the NMISA needs to take cognisance of, not only the replacement of aged equipment, but also of the fact that instrumentation procured now may also be obsolete in three to five years' time.

The NMISA is located on the CSIR's Scientia Campus in Pretoria. The NMISA still occupies the metrology laboratories, as was the case when the CSIR National Metrology Laboratory, the forerunner of the NMISA, took occupation of the site during the late 1950s. With no major building infrastructure investment during its history (the NMISA became a tenant on the premises in 2007), the building infrastructure has now reached its technical limit of modifications.

In response, the NMISA motivated for a recapitalisation of the NMS and new building infrastructure, and a project was registered with the National Treasury for a feasibility study towards recapitalisation. Additional funding of R50m were allocated for 2013/14, R100m for 2014/15 and R150m for 2015/16. With the assistance of the PPP Unit of the National Treasury, a feasibility study is now underway to determine the best model for the new building infrastructure, as well as for a sustainable model for the continuous upgrading and maintenance of the NMS.

10.1 PERFORMANCE DELIVERY ENVIRONMENT (EXTERNAL)

South Africa is a signatory to the Metre Convention, which is a treaty dating back to 1875. In terms of 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 national measurement standards. The SI was also established in terms of the Metre Convention and is overseen by the International Committee for Weights and Measures (CIPM). The entire system is governed by the General Conference on Weights and Measures (CGPM), whose members are the states that signed the Metre Convention. South Africa adhered to the treaty in 1964.

In 1999, the BIPM and the national metrology institutes (NMIs), with the consent of their governments and thus the CGPM, established the CIPM Mutual Recognition Arrangement (MRA). The CIPM MRA gives users reliable quantitative information on the comparability of national metrology services and provides the technical basis for broader agreements negotiated in terms of international trade, commerce and regulatory affairs. It constitutes the basis for the international acceptance of national measurement standards and for calibration and measurement certificates issued by NMIs.

As the custodian of the South African NMS, the NMISA develops and maintains primary and secondary standards (chemical and physical quantities) for South Africa and compares those standards to other national standards (and the international standard for mass, the International Prototype of the Kilogram) to determine their equivalence and ensure global comparability. These standards are disseminated to the South African industry via a range of services and products and, in the case of a measurement dispute, reference analyses are provided to ensure conformity.

Technological advances over the past decade are placing stringent demands on metrology. New areas in metrology, such as nanotechnology, optical techniques, quantum-based technologies, material sciences, etc., are developing rapidly and require new measurement methods and measurement standards. In response, the NMISA is investing more funds in research activities and is actively

pursuing opportunities for collaboration with their peers, in order to pool resources. The NMISA therefore engages in research aimed at the improvement of existing standards and to facilitate the development of new measurement standards to address emerging national needs.

10.1.1 International and Regional

The CIPM established a number of consultative committees (CCs), ten in total, to oversee and arrange for the comparison of national measurement standards. The CCs bring together the world's experts in their specified fields as advisers on scientific and technical matters and are pivotal in the arrangement of key comparisons that compare the measurement capabilities and determine the measurement equivalence of national measurement standards. The NMISA has full membership of nine of the ten CCs, as well as membership of the CIPM. Membership of a CC is open to institutions of member states of the BIPM that are recognised internationally as experts in that field. This normally requires that:

- they be national laboratories, charged with establishing national measurement standards in the field;
- they realise, keep and maintain primary standards;
- they be active in research and have a record of recent publications in research journals of international repute; and
- that they have demonstrated competence by a record of participation in international comparisons, organised either by the CIPM via its CCs, the BIPM or a regional metrology organisation (RMO).

The NMISA plays a key role in the establishment of measurement traceability and the international equivalence thereof, sitting at the interface between the national and international systems, and it contributes to the elimination of technical barriers to trade (TBTs). The NMISA also plays a leading role in the development of metrology infrastructure in Africa – especially in support of South Africa's immediate neighbours in the SADC. This is crucial for the successful implementation of regional free trade agreements. This role is emphasised in **the dti**'s strategic goals and the South African contribution towards mutual acceptance of testing results in the region.

10.1.2 The Technical Measurement Environment

Participation in international activities at CC and Technical Committee (TC) level are imperative. These interactions serve to benchmark South Africa's capability to compete in measurement equivalence that directly impacts on the NMISA's ability to disseminate traceability to the country. In order to do this, metrologists have to be extremely proficient in measurement science and techniques. This requires time and effort, as it takes three to five years to master the art of metrology to the level where international participation is meaningful. It also requires sophisticated techniques, as well as time, money and excellent planning to align with the international call for participation, as well as the availability of scientists and resources in the laboratory. This has to be balanced with national collaborative projects and research projects that are ongoing as part of the performance requirements in each laboratory.

Training and development of young scientists remains crucial, as metrology skills are not readily available in the market. The pool of young professionals, especially young black professionals, is not yet adequate. An integrated training and development plan was developed to assist each metrologist, whether experienced or new in the field, in improving skills and thus ensuring a pipeline of young metrologists via the bursary programme, training in metrology and internships. These young professionals are provided with skills suited to industry and, where possible, appointed as metrologists.

10.1.3 The National Role

The NMS maintained and disseminated by the NMISA underpins and/or supports, directly and indirectly, the daily activities of South Africa on almost all levels. As one of **the dti**'s technical infrastructure (TI) entities, the activities of the NMISA are crucial to the success of the other TIs. Standardisation, metrology, conformity assessment and accreditation constitute the key issues in the implementation of free trade agreements between countries/economic trade blocks. The NMISA plays a role in providing technical support for many other Acts and regulations, ranging from the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) to the Atomic Energy Act, 1967 (Act No. 90 of 1967). It serves the more than 1 300 accredited laboratories in South Africa and provides measurement and measurement assistance to more than 400 industrial companies.

The national significance of the NMISA is illustrated in the NMISA not only forming the link between the international measurement system and the South African measurement system, but also in the vertical integration, which allows South Africa to have a credible domestic measurement system to facilitate and ensure trade, commerce, manufacturing, services, as well as consumer and environmental protection.

10.2 ORGANISATIONAL DELIVERY ENVIRONMENT (INTERNAL)

10.2.1 The Organisation

The NMISA manages its technical activities through four technical divisions, namely Physical Metrology, Electricity and Magnetism (EM), Ionising Radiation (IR) and Chemistry, with two cross-cutter divisions that coordinate Research and Development (R&D) and the liaison activities with the TI, with international and the regional metrology organisations, as well as with technical infrastructure development (TID). The divisions are supported by Finance and Corporate Services.

The technical activities of the NMISA are mapped onto the international metrology structures, especially the ten CCs of the CIPM. Cross-cutting initiatives, such as materials metrology and environmental metrology, allow for the use of expertise from different technical divisions to contribute to national priorities, such as nanotechnology and environmental monitoring in support of climate change programmes.

The NMISA adheres to a total quality management system and the environmental health and safety (EHS) practitioner and supporting structures handle all matters relating to health and safety of staff, from ensuring a safe working environment; identification of laboratory and workplace hazards/aspects and ensuring environmental sustainability, to the training of staff in safety awareness, inspections, and compliance with the relevant legislation.

The NMISA identified the regulatory requirements applicable to its service operations and products, in order to maintain regulatory compliance. The NMISA achieved certification of its occupational health and safety (OH&S) and EHS management system, guided by ISO 14001 and OHSAS 18001, which specifies requirements for environmental management systems (EMS), as well as an OH&S management system to enable the NMISA to control its OH&S risks/ environmental aspects and improve its OH&S and EMS performance.

The NMISA delivers its services in a variety of ways, as specified below.

Calibrations: Delivering direct traceability to the national measurement standards, the NMISA serves the accredited calibration laboratories by performing calibrations to the highest accuracy (smallest uncertainty). The NMISA holds accreditation with ISO/IEC 17025 for most of the parameters and

ranges for which it offers calibration services. Calibration is also provided directly to industry in cases where there are no accredited calibration laboratories or when the desired accuracy can only be provided by the NMISA.

Reference measurements and certification of reference materials: The NMISA provides reference measurements and analyses in accordance with its calibration range and services. In addition, the NMISA built capability to value assign chemical samples and gas mixtures for customers, including purity. This capability allows the NMISA to produce pure standard CRMs or calibration solutions that are internationally recognised and accepted.

Measurements, testing and analysis: The NMISA offers advanced measurement services to industry. These include method development for customers to assist them with problem-solving, as well as performing analyses in support of research projects.

Training: The expertise residing in the staff of the NMISA constitutes an important contribution to the development of a skilled and capable workforce via training in measurement science. Where and when required, the NMISA assists the NLA with training courses. Special development projects, aimed at assisting SMEs were established and are being rolled out. The NMISA staff members are also involved as invited lecturers in graduate and postgraduate academic courses.

10.2.2 The Technical Divisions

10.2.2.1 Research and Technology Development

Research that underpins the national measurement standards involves collaborative associations and projects with government, science institutes and academia; and sources external revenue via these collaborative associations and projects. Acknowledging that there is a host of analytical needs, the NMISA prioritised activities and focuses on three or four thematic thrusts, aligned with IPAP, which include and support green industries, as well as enhancing manufacturing competitiveness and ensuring consumer protection.

The technical strategic objectives of the NMISA can be linked to strategic thrusts and these are delivered by the technical divisions and coordinated by Research and Technology Development with regard to cross-cutting projects. There is a clear distinction between maintenance of the primary and secondary SI units, dissemination to industry via calibration, training and technical support, as well as the development and research projects that will contribute towards clear deliverables against strategic objectives, as well as towards publications and human capital development.

To ensure proper coordination of priority projects of national interest and the monitoring and evaluation of deliverables in research and development projects, the technical divisions are structured in a matrix organisational structure. The matrix type organisation is a type of a hybrid – a mix between functional and project organisational structures. It provides the project and customer focus for the project structure, while it retains the functional expertise of a functional structure, which is an important element in a field such a metrology where it takes years of postgraduate studies to develop competent metrologists.

The projects are organised as multi-disciplinary projects across technical divisions that will deliver outcomes, such as new/improved NMS. The outcomes of the cross-cutting projects will then be handed over to the technical divisions for maintenance and dissemination to industry. Project managers are responsible for project results, while functional managers are responsible for providing the resources needed to achieve the results.

The matrix organisational structure also provides opportunities to people in the functional divisions and sections to pursue career development via assignments to various types of projects. This also allows for easier coordination of student development projects, such as the NMISA postgraduate bursary programme.

Figure 1 below presents the matrix nature of the NMISA technical divisions, with the Research and Technology Development Division providing the project coordination function. Project managers will be metrologists, appointed from the leading technical divisions.

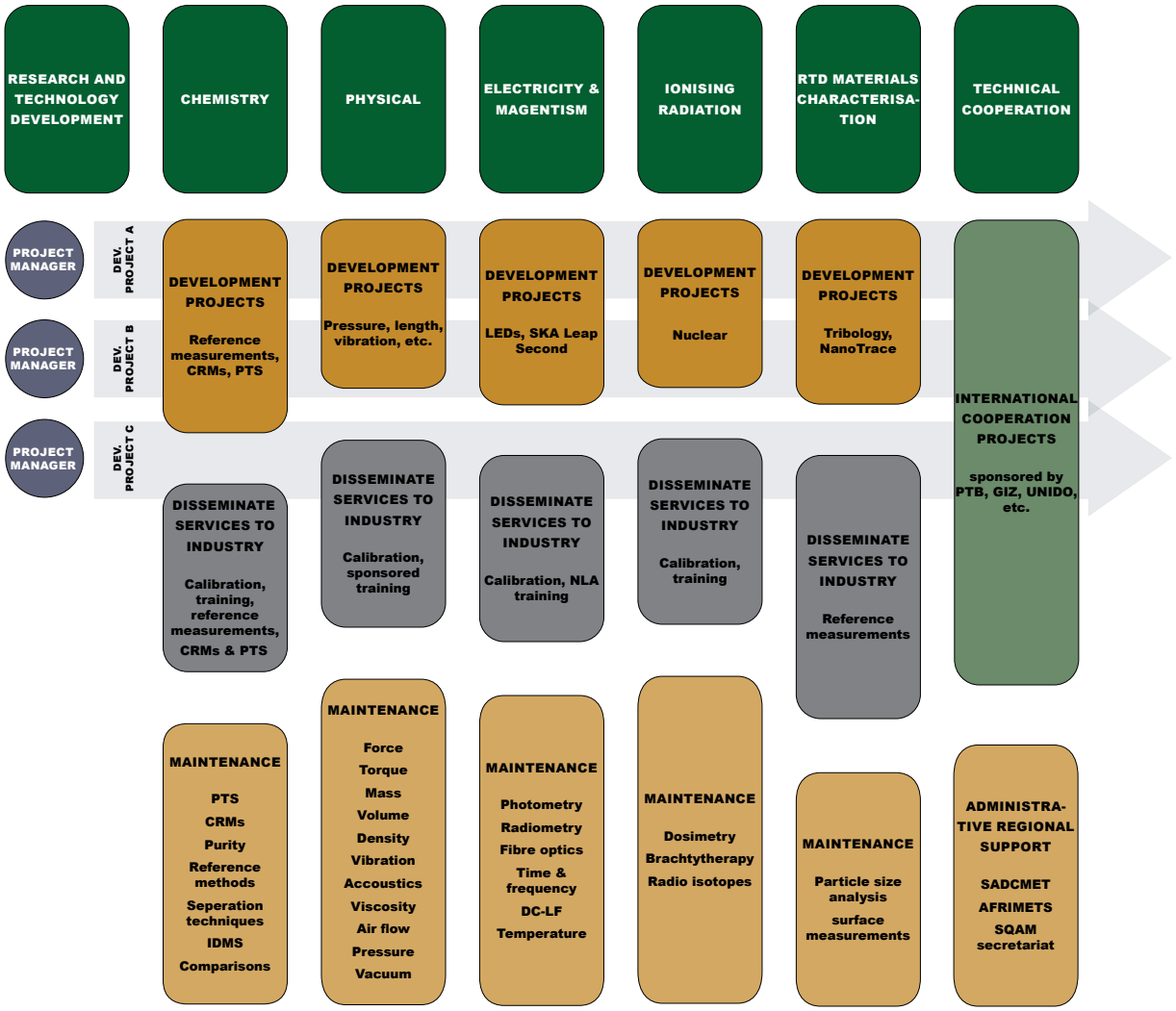


Figure 1. Technical Organisational Structure

Projects will be approved annually to be included in the Annual Performance Plan (APP) and the Business Plan. Project teams and project managers will be appointed. Some of the cross-cutting projects to be considered on the 2015 – 2018 planning horizon are presented in Table 1 below.

Table 1. Cross-cutter Research Projects

Cross-cutter Project	Task	Project Numbers and Title	Major Outputs (expected end of 2017/2018)	Link to Scorecard, and Regional and International Partnerships	Project Budget (2015/2016) R'000
African Food and Feed Reference Material Programme (AFFRMP)	**AFRICAN FOOD AND FEED**				
	1. Stakeholder needs analysis	AFFRMP_1 Marketing and communication for the AFFRMP	• Marketing and communication with key stakeholders and needs analysis	KPI 11, 12, 13	R 505
	2. Food and Feed Matrix Reference Material preparation facility for Certified Reference Material Processing	AFFRMP_2 Materials processing	• Materials processing, packaging, storage and inventory control • Matrix RMs for Africa in support of export and locally consumed food	KPI 1,2 & 3 Links with the opportunity to participate in the BIPM Visitor Programme on Mycotoxins (additional donations/ funding will have to be sourced).	R 10 736
	3. Characterisation and value assignment of the reference material under development	AFFRMP_3 The certification of toxic and nutritional elements in wheat flour	• Reference measurement capability and validation for purity and residue analysis of contaminants (POPS, toxic and nutritional elements in food, mycotoxins, etc.) • The certification of toxic and nutritional elements in wheat flour; multi-mycotoxin in maize; the development of reference measurements for amino acid content in infant formulae; PAHs in sea-food and tea; hazardous organic chemicals in South African fish; dioxins and dioxin-like PCBs in food and feed and water activity measurements on food and feed matrices Phthalates in PVC food packaging	KPI 3, 5, 6, 7, 9.1, 9.2, 10.2, 10.4 and 13.1 Links with the opportunity to participate in the BIPM Visitor Programme on Mycotoxins. This aspect will directly the successful development of mycotoxin reference materials. ~60% of costs must be carried by the visiting NMI and funding avenues must be explored. The purity/calibration interaction with BIPM is captured under the organic section and is not included in the cross-cutter (purity of organic calibrators, specifically ochratoxin and fumonisins, incl. use of q-NMR). This collaboration is of importance to African NMIs and will also support efforts via AFRIMETS to develop and disseminate food traceability and link up with AU projects.	R 716
		AFFRMP_4 The development and validation of multi-mycotoxins in maize reference measurements and reference materials			R 1 386
		AFFRMP_5 Development and validation of amino acid content in infant formulae			R 836
		AFFRMP_6 Phthalates in PVC food packaging			R 410
		AFFRMP_7 Determining the level of PAHs in sea-food and tea			R 397
		AFFRMP_8 The determination of hazardous organic chemicals in South African fish			R 228
		AFFRMP_9 The determination of dioxins and dioxin-like PCBS in food and feed			Budget for 2016/2017
		AFFRMP_10 Water activity measurements on food and feed matrices			R 328

* Note the budget amounts include HR costs, OPEX and CAPEX

Cross-cutter Project	Task	Project Numbers and Title	Major Outputs (expected end of 2017/2018)	Link to Scorecard, and Regional and International Partnerships	Project Budget (2015/2016) R'000
African Food and Feed Reference Material Programme (AFFRMP) (continued)	**AFRICAN FOOD AND FEED (continued)**				
	4- Dissemination of the CRM material to industry	AFFRMP_11 Information technology and business intelligence for the AFFRMP	• Logistics and inventory, training workshops, IT platforms and financing for distribution • Training of food analysts in SADC accredited labs and African NMIs • Instrument development and maintenance workshop	KPI 11, 12, 13 The reference materials, once concluded, will be supported through a well-planned mechanism to launch sales and disseminate traceability and training to the region and Africa.	R 193
		AFFRMP_12 Logistics/ Inventory/Sales			R 112
	5- Human capital development	AFFRMP_13 Human capital development	• Recruitment and management of interns and bursars • Linked closely with AFFRMP_3	KPI 10.2 and 10.4 This element is a vital cog to ensure integrated human capital development. It will provide opportunities for interns and bursars.	R 168
Green Economy Measurement Tools	**A. GREEN ECONOMY**				
	Measurements to support green economies	GREEN_1: The development of a NMS for LEDs	• Accurate LED measurement methods and standards developed to ensure traceability	KPI 3, 6, 9.1, 9.2, 10.2, 10.4 The development and implementation of a measurement capability for light-emitting diodes (LEDs), to support the energy-saving drive in South Africa in support of IPAP. The move towards LED lighting is propelled by its high efficiency that will underpin savings in terms of energy and cost. Local industry indicated an urgent need for standardisation and measurement ,due to the large number of inferior products imported.	R 1 030
		GREEN_2: Development of AC power standard with in-house traceability	• A primary power standard	KPIs 1, 2, 3 and 13.1 A primary AC power standard with in-house traceability to ensure sustainability in support of accurate electrical energy measurements across all sectors in industry.	R 514

Cross-cutter Project	Task	Project Numbers and Title	Major Outputs (expected end of 2017/2018)	Link to Scorecard, and Regional and International Partnerships	Project Budget (2015/2016) R'000
Green Economy Measurement Tools (continued)	**A. GREEN ECONOMY (continued)**				
	Measurements to support green economies (continued)	GREEN_3: Traceability for nanostructured base material for solar cell applications	• Traceability relevant for nanomaterial analyses, the photovoltaic industry, microelectronics, coatings and thin films, etc.	KPI 9, 10.1 and 13.1 Collaboration/partnership with the CSIR Nano Centre, UWC and Missouri University, USA; and indirectly with NIST's Materials Division. Links to current VAMAS projects on pre-standardisation of coating thickness on nanoparticles. Solar cells, based on nanostructured materials, are expected to exceed the thermodynamic efficiency limit proposed for traditional bulk silicon solar cells. Two PhD projects – as part of Razia Adam PhD studies and new PhD studentship.	R 907
	B. ENVIRONMENTAL MONITORING				
	Environmental monitoring	ENV_1: New PRGMS for air pollution monitoring	• Development of two new NMS for air pollution monitoring primary reference gas mixtures for automotive and stack emission gases, as well as volatile organic compounds	All KPIs Martin Brits' PhD Desmond Tutu scholarship with VU University, Amsterdam. Training received at VU and the Ministry of the Environment will directly underpin all the ENV projects to ensure traceable methods for environmental monitoring.	R 4 491
		ENV_2: Pesticide analysis in environmental matrices	• Reference measurements for all persistent organic pollutants in environmental, biotic and abiotic matrices		R 7 290
		ENV_3: PAHs develop methods for the extraction, analysis and quantifications of PAHs in soil, sediment, wild bird eggs, fish, coral and other aquatic biota (links with AFFRMP_3 for PAHs in sea-food and tea)	• Reference measurements for PAHs in biotic and abiotic matrices, impacting on health and safety, as well as on import and export security • Measurements to support environmental monitoring for persistent contaminants and toxic substances.		R 548
		ENV_4: To develop extraction and analysis methods for perfluorinated compounds (PFCs) in soil, sediment, biotic and abiotic matrices	• Reference measurements for PFCs in environmental media		R 510

Cross-cutter Project	Task	Project Numbers and Title	Major Outputs (expected end of 2017/2018)	Link to Scorecard, and Regional and International Partnerships	Project Budget (2015/2016) R'000
Green Economy Measurement Tools (continued)	**B. ENVIRONMENTAL MONITORING (continued)**				
	Environmental monitoring (continued)	ENV_5: Develop methods for the extraction, analysis and quantification of dioxins and brominated flame retardants (BFRs) in various complex environmental matrices	• Validated metrologically traceable reference methods for the accurate quantification of dioxins and BFRs impacting on health and safety, as well as on import and export security (links with AFFRMP_3 for dioxins in food and feed)		R 2 463
		ENV_6 Reference measurement for particle size, using static optical imaging particle size	• Reference measurement method for particle size analysis, using *static optical imaging*		R 373
Measurement in Support of Local Manufacturing	**MEASUREMENT FOR MANUFACTURING COMPETITIVENESS PROJECTS**				
	Heavy manufacturing (machinery and the transport industry)	MMC_1 Surface texture measurements	• New methods developed for surface texture measurements	KPI 3, 5, 6, 10.2 and 11 In support of IPAP; the automotive and advanced manufacturing sectors.	R 800
		MMC_2: Paint thickness and micro-harness	• Commission micro-harness system, obtain accreditation and develop/improve method accuracy of the system	KPI 3, 5, 10.2 and 11 In support of IPAP; the automotive and advanced manufacturing sectors.	R 300
		MMC_3: Machine tool evaluation	• Procure identified equipment and establish new facility to allow the NMISA to assist SAA with machine calibration	KPI 10.2 and 11 In support of IPAP; the aerospace and defence sector.	R 1 800
	Thin films and coating technologies	MMC_4: Establish the failure mechanism for thin film/coating synthesis techniques and the negative impact on synthesis applications	• Root cause of failure during manufacturing • Proposed ways to overcome/prevent such failures; concurrently decreasing manufacturing downtime	KPI 9, 10.1 and 13 In collaboration with the CSIR Nano Centre and UWC. MSc studentship.	R 800
	Investigation into new techniques for additive manufacturing	MMC_5: Additive manufacturing (3D printing)	• Consult with members of RAPDASA and other role-players. Identify one or two projects and perform a feasibility study	KPI 10.2 and 11 In support of IPAP; the advanced manufacturing (additive manufacturing) sector. Note: A feasibility study, upon completion of the study outputs, may differ.	R 296

10.2.2.2 Physical Metrology Division

Physical measurements are fundamental to the manufacturing of high quality goods and services and the construction of infrastructure. The Physical division forms the foundation of all measurements in mass, volume, density, air flow, force, torque, hardness, pressure, vacuum, viscosity, acoustics, ultrasound, vibration and dimensional measurements. The division's primary functions are to ensure that the mentioned metrology parameters are scientifically valid, that the NMS's are internationally comparable and the dissemination of it.

The Division is positioning itself as the source of measurement traceability for physical measurement parameters not only in South Africa, but also in SADC. This will be achieved through especially fit-for-purpose measurement standards in Mass and Related Quantities, Acoustics, Ultrasound, Vibration and Dimensional measurements by using internationally recognised methods and calibration procedures.

In support of IPAP, the Division has prioritised its activities and focuses on Green Industries, Enhancing Manufacturing Competitiveness and ensuring Consumer Protection. These activities include:

- The modernisation of the Force facility.
- The re-establishment of a Torque facility.
- Strengthening the HR component in the Three Dimensional measurement facility.
- The appointment of personnel to enable the establishment of an Ultrasound and Underwater-acoustics facility.
- The enhancement of the Air Flow facility.
- Strengthening the HR component in the Pressure, Vacuum and Gas Flow laboratories

To assist the Environmental Monitoring community with traceability for air flow measurements, a requirement for their accreditation which is now required by law, the Air Flow facility will focus on improving their measurement range and uncertainty of measurement. In addition to the HR component of the facility, it will be strengthened by training and appointment of additional staff.

To assist the stack emission testing community with traceability for air flow measurements, a requirement for their accreditation as required by law, the Air flow laboratory will focus on improving its measurement range and uncertainty of measurement. In addition to the HR component of the facility, it will be strengthened by training.

Development work on the maintenance of NMS and transfer standards will be continued in the fields of; Acoustics, Vibration, Length and Force.

The Division will be active in the upliftment of NMIs in SADC. This will be achieved through the training of metrologists of SADC NMIs, assistance with development plans and the creation of specifications for procurement.

The Division will continue to strengthen its HR component with the appointment of personnel in vacant positions and the training of newly appointed staff.

10.2.2.3 Ionising Radiation Division

The Ionising Radiation (IR) area, comprising Dosimetry (DS) and Radioactivity Standards (RS), provides traceability and specialised measurement techniques for users of radiation products and techniques in the country and the region. IR is furthermore establishing itself as a regional measurement and traceability hub to enable accurate ionising radiation measurements to support trade and energy efficiency, as well as environmental, health and safety requirements. This will be achieved by establishing national measurement standards that are fit-for-purpose for the African region; that are traceable to international measurement

standards; while staying abreast of the developments of standards internationally; and by training end-users from NMIs in the region in this field of expertise.

The group ensures that the South African measurements standards and units, in these areas, are internationally comparable and scientifically valid, allowing for correct diagnoses and medical doses to be administered to patients; as well as for quality control in the manufacturing of radioactivity solutions. The laboratories maintain standards that are in line with the units defined by the International Committee for Weights and Measures (CIPM) at the International Bureau of Weights and Measures (BIPM).

The IR area will grow into maintaining standards related to ionising radiation to support the environment, the health and safety of humans and nature, while also extensively supporting the ionising radiation regulatory bodies in the country. The area will employ more staff members to enable it to achieve its goals and objectives. It will also assist its staff members with furthering their studies, thus improving the qualification profile of the area.

The technical areas of focus for the APP period will be re-establishing the x-ray capability; absorbed dose-to-tissue-using Beta emitting sources; and neutron capabilities. All these are required for ensuring the safety of radiation workers. With regard to health application, the establishment of measurement capabilities for high-dose rate measurements at the NMISA, pertains to its use for the treatment of cancer. The establishment of a radio-analytical laboratory for environmental samples, in conjunction with the National Nuclear Regulator, is to ensure compliance with all South African laws by license holders of different facilities, including mines. These will help ensure the safety of South Africans when working in areas where they could be exposed to ionising radiation and also where they might be undergoing treatment, using ionising radiation techniques.

10.2.2.4 Electricity and Magnetism Division

The Electricity and Magnetism (EM) Division delivers reliable calibrations or measurements, involving electromagnetic parameters for all apparatus requiring top-level calibration (including emerging technologies, such as light-emitting diodes), over sufficiently wide ranges, at sufficient accuracy levels, so as to satisfy the current and projected future (short to medium-term) needs of its stakeholders.

The EM Division aims to provide more focussed measurement services, decreasing the number of low-level and increasing the number of high-accuracy calibrations performed. Income from calibration should be maintained, while increased efficacy, owed to the efficient utilisation of staff and equipment (measurement automation), should allow growth in the areas of training, consultancy and research.

In support of government's drive to reduce national energy consumption, the NMS will be enhanced. This will facilitate the use of energy-efficient lighting systems and assist with the elimination of wasteful industrial energy consumption and inaccurate billing. For example, these standards will provide users with reliable measurement values to establish whether lighting products satisfy the properties, performances and technical specifications required by regulations aimed at improving energy efficiency.

Access and the use of information and communications technologies (ICTs) constitute a key requirement to social and economic development in South Africa. Increased access to broadband services at a reduced cost to individuals and businesses, is a national priority. Business process servicing (BPS) has the potential to attract investment and create employment opportunities in the economy. An affordable and reliable ICT infrastructure is the most important prerequisite for making

South Africa a successful BPS destination. The Electricity and Magnetism Division contributes to the current and future expansion of South Africa's ICT industry, by developing and maintaining standards to regulate optical fibre and wireless communication systems, and to perform diagnostic network tests at high accuracy levels.

10.2.2.5 Chemistry Division

This division develops traceable methods to underpin reference analysis in support of industry, while aligned with the IPAP initiative. Dissemination of its capabilities is further done via reference analysis; the development of reference methods (national measurement standards in chemistry); providing proficiency testing schemes (PTS); and the production of certified reference materials (CRMs) in support of agriculture, chemicals, energy, climate change and clean air, food safety, health and environment, pharmaceuticals, metals, law enforcement, as well as the manufacturing and mining industries.

In addition, the division supports South Africa's export and local trade so that it is not hampered, by meeting (where possible) the international laws and regulations that stipulate stricter limits on pesticides, dioxins, mycotoxins, toxic elements and other hazardous substances in various South African commodities, including support for the African Food and Feed Reference Material Programme, as well as manufactured goods. With the emphasis on ensuring that the division's activities remain sustainable and applicable within a challenging economy, the division will, in conjunction with RTD, focus on contract research projects (mainly in support of green energy, consumer protection and agricultural food and feed) and limited contract analysis, in order to increase external funding required to substantiate the relevance of the measurement services offered to industry.

The division will actively participate in research projects of national interest, in support of the cross-cutter research initiative. All research outputs will support the maintenance of reference measurements (national measurement standards), new and improved NMS, PTS and CRMs being offered. Resourcing the laboratories and increasing capacity-building via the integrated HCD Programme, will also be aligned with the research thematic projects planned. The first two cross-cutter projects are described in Table 1.

10.2.2.6 Materials Characterisation

The Materials Characterisation group (MAT), will continue to upgrade and renew its measuring instruments in support of materials characterisation within metal development, green energy sectors, as well as advanced materials development for research institutions. The Scanning Electron Microscope (SEM), X-ray Photoelectron Spectroscope (XPS) and, especially the Time-of-Flight Secondary Ion Mass Spectroscope (TOF-SIMS) will be marketed to external clients. The customer base will have to be re-established and new markets will be explored, with specific emphasis on measurement assistance to major research projects.

MAT trains postgraduate students and researchers from science institutes to perform SEM, XPS and SIMS analyses. This is a highly specialised field and may take three to six months per training period. It is envisaged that six scientists will be trained.

MAT will continue to establish, maintain and upgrade its measuring instruments and methods in support of diverse industrial and research sectors. MAT provides advanced measurement support to materials characterisation, with a specific focus on measurements for nanotechnologies and other advanced material groups (thin films/coatings, particles/powders, alloys). The Scanning Electron Microscope (SEM), X-ray Photoelectron Spectroscope (XPS-Quantum) and, especially the Time-of-Flight Secondary Ion Mass Spectroscope (TOF-SIMS), will be marketed to industry, as well as to academic clients. The customer base will have to be re-established and new markets will be explored, with specific emphasis on measurement assistance to major research projects. MAT trains postgraduate students and researchers from science institutes to perform SEM, XPS and SIMS analyses. This is

a highly specialised field and may take up to three months per training period. It is envisaged that three scientists will be trained over the next three years.

MAT will participate in, and contribute to ISO committees developing standards for materials measurement, and represent South Africa in VAMAS, as well as ensure the inclusion of South African interests in the Versailles Project on Advanced Materials and Standards (VAMAS) policies and activities. In support of providing traceability and a general awareness of measurements related to materials metrology, MAT will run proficiency testing schemes (PTS) related to dimensional and elemental composition measurements. Additionally, MAT will disseminate materials characterisation expertise via publications and presentations at conferences. It is envisaged that MAT will attend at least three conferences and publish four publications per annum.

In addition to assisting with some of the proposed cross-cutter projects related to IPAP focal areas of measurements within the green economy and local manufacturing, MAT will actively participate in, and support materials research projects in collaboration with research institutes. The outputs of these collaborations will contribute to the basis for advancing the existing national materials characterisation capabilities via exploring means for local traceability, scientific publications and presentations, as well as running local PTS. MAT will also perform method validation studies in collaboration with other sections within the NMISA, with the aim of establishing local, in-house traceability for materials characterisation (e.g. metal alloy elemental composition, glass composition, elemental depth profiling, etc.).

10.2.2.7 Technical Infrastructure Development (TID)

The primary role of the Technical Infrastructure Development Division of the NMISA is to increase the impact of the institute and metrology at all levels of society; manage relationships and obligations within the Metre Convention and the Mutual Recognition Arrangement between NMIs (CIPM MRA); ensure the inclusion and participation of metrology in technical infrastructure; develop and foster metrology amongst stakeholders and clients; and identify and grow new business opportunities.

During the period 2015 to 2018, there will be a specific drive to develop new business via assistance to SMEs, with the potential to export, to meet measurement needs, as well as to meet the technical specifications as preferred suppliers. Furthermore, targeted assistance will be given to rural SMEs with basic training in metrology. Cooperation with the metrology institutes of the BRIC countries will be improved on issues of joint concern, such as to provide accurate measurement for biofuels, nanotechnology and advanced manufacturing. Specific metrology development projects are also planned with other NMIs in the region, to assist intra-regional trade. This will also include a special focus on assistance to exporters to negate technical barriers to trade with main trading partners, both regionally and internationally.

10.2.2.8 Human Resources

In the development towards a more modern NMI with a strong research and development component, the qualification profile of the NMISA has to be addressed. Projects to enhance the profile include the internal development of staff, as well as dedicated bursary and postgraduate studentship schemes. Four staff members who are involved in the internal development project will obtain their doctoral degrees over the next two to three years, while some staff members holding MSc degrees have been identified for the programme, in line with proposed measurement projects. The target qualification profile is projected in Figure 2.

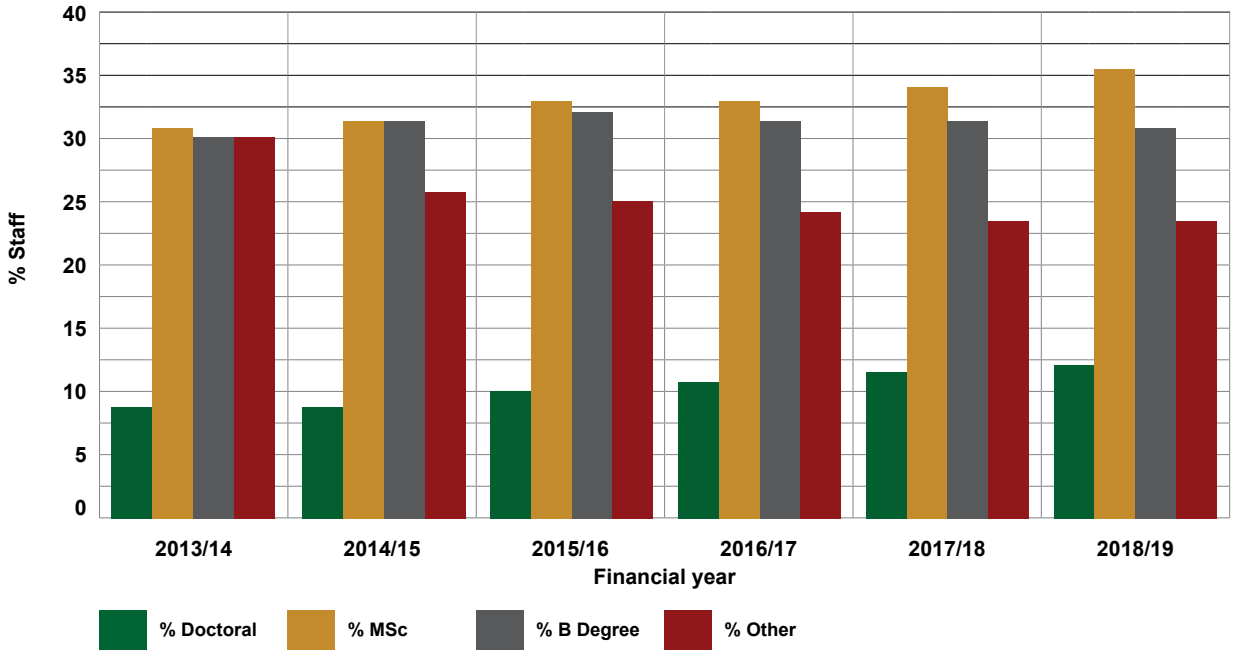


Figure 2: Projection of staff qualification profile

The NMISA will continue to focus on recruiting black professionals, as the institute's employment equity profile is lagging behind the set targets. This is due to a limited pool of suitably trained black professionals, as well as an outflow of newly trained metrologists to calibration laboratories and industry. Various programmes have been implemented to address employment equity and to boost the recruitment and retention of black professionals. The projected employment equity profile, based on the national economically active population, as is illustrated in Figure 3. Evaluating past trends in staff turn-turnover percentages, the demographics of the resignations, upcoming retirements and the ability to appoint skilled black professionals, a growth rate of 3% to 4% per annum is projected, resulting in a transformed workplace by 2018/19. Efforts will also be made to improve the representivity of female professionals at all levels.

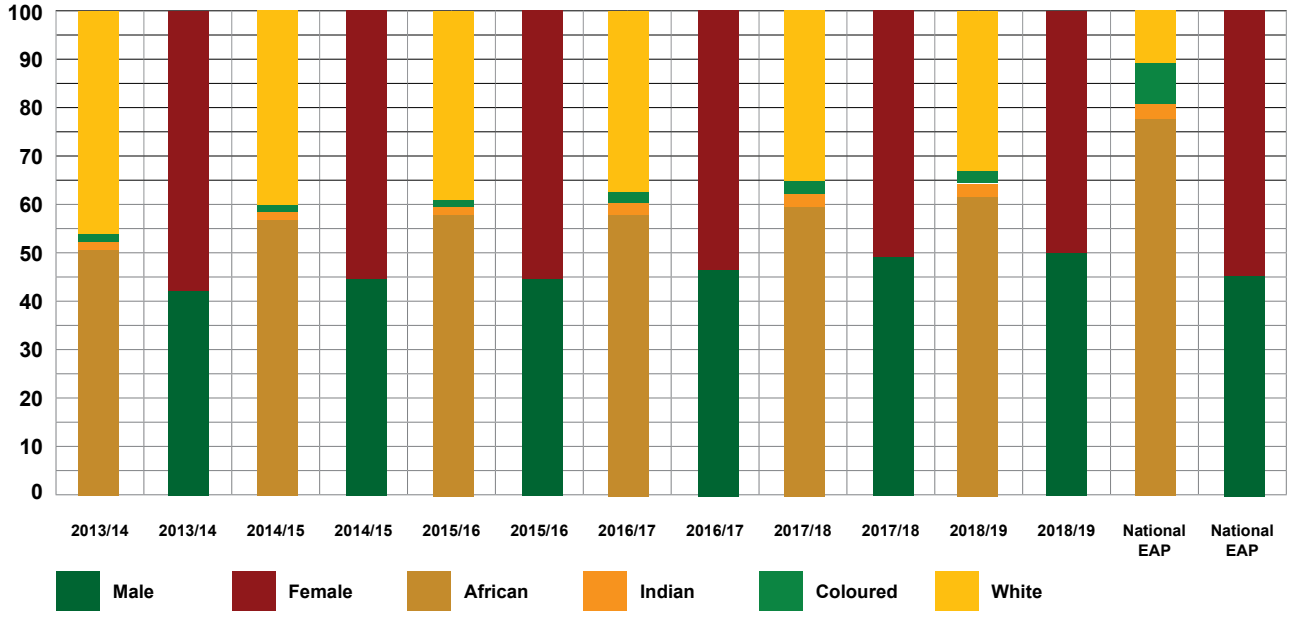


Figure 3: Employment equity/staff demographics

An undergraduate bursary and postgraduate studentship programme was launched in 2011/12, to start the internal development of a pipeline of young black researchers who will be assigned to specific projects where senior researchers will be able to mentor and guide them through their study programmes, while contributing to the technical development of national measurement standards and safeguarding the next generation of metrologists via an integrated staff development approach.

The HCD programmes include the following:

- Internship programme
- Contract researcher programme
- Postgraduate studentship programme
- 'Shadow' and mentoring programmes

Other programmes that will be implemented over the next few years include the following:

- Staff exchange opportunities
- Higher qualifications in metrology from international tertiary institutions
- Participation in national HCD initiatives
- Structured vacation work programmes

10.2.2.9 Finance and Corporate Services Division

The division provides an array of different services in five units to meet corporate, statutory and compliance requirements, along with transactional, administrative and professional services to the business, and also delivers financial and management reporting to facilitate an informed decision-making process. The Information Technology (IT) Unit on the other hand, ensures that the NMISA's IT infrastructure is available to users at all times. Documentation of policies and procedures, in line with International standards and best practices, will remain a focal area for this unit. The IT Unit will continue to work hand-in-hand with the Information and Communication Unit, in order to enhance the NMISA website as an effective communication tool. Human Resources (HR) management focuses on ensuring that the human capital within the NMISA is well equipped to meet the strategic mandate of the institute. The HR Unit will work in conjunction with Information and Communication to position the NMISA as an employer of choice, in order to attract young scientists. Facilities Management mainly focuses on the stability of the internal electricity supply, air-conditioning and general maintenance.

10.3 ALIGNMENT TO the dti

Acknowledging that there is a host of analytical needs, the NMISA prioritised activities and focuses on three or four thrusts, aligned with IPAP, which include environmental monitoring (persistent organic pollutants and air pollution monitoring), food safety (nutritional content and contaminants), photonics (ICT, etc.), nanotechnology, metal fabrication, measurements related to biofuels, as well as the development of measuring equipment and solutions fit-for-purpose for the development of rural areas.

10.3.1 Contribution to Manufacturing and Industrial Development

Without a measurement infrastructure, it is difficult to manufacture in accordance with international specifications and tolerances, in order to ensure the integrity of export commodities. By maintaining internationally accepted measurement standards for mass, volume, length and area, the NMISA not only ensures fair trade within South Africa, but also ensures that South African trade goods are accepted internationally with regard to quantitative requirements. The NMISA impacts directly on a number of sectors while, in many cases, the impact is indirect. There are areas where the organisation could have an impact, but potential impact is limited due to a lack of national measurement standard for some parameters.

The automotive original equipment manufacturers (OEMs) rely on validated master moulds and prototypes to ensure that locally manufactured components comply with mother company specifications and tolerances. The NMISA's dimensional services provide the necessary traceability, as well as upgrades and developments to the national measurement standards, so as to meet the stringent industry requirements.

10.3.2 Contribution to Trade and Commerce

The trade of goods and services around the world is the lifeblood of the global economy and it is becoming increasingly important with regard to 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 need to be the equivalent of each other and accepted by each other.

Without internationally comparable mass standards of the highest accuracy, the Chemistry Division will not be able to underpin its measurement methods and certified reference materials or perform quantitative reference measurements. The reason for this is that chemical traceability is directly linked to mass and amount of substance, thus forming the basis of chemical metrology.

11. THE PLANNING PROCESS

The divisional goals and strategic objectives are fully aligned with the obligations of the NMISA as enacted, as well as the priorities of the Executive Authority (**the dti**) and other stakeholders.

The NMISA meets regularly with **the dti** on a number of forums, of which the most important are the following:

- Annual meeting with the Minister of **the dti**
- Quarterly COTII meetings
- Quarterly CEO and **the dti** meetings
- Monthly meetings with the DDG responsible for the NMISA
- TI IPAP meetings (at regular intervals as required)
- Other meetings on specific **the dti** priority areas (TBTs, SADC issues, tri-partite negotiations, etc.)
- The NMISA supports **the dti** at NEDLAC meetings

These interactions ensure that the outcomes-orientated goals of the NMISA are aligned with **the dti**, as well as with national priorities.

The sustainability of the NMISA's activities and its ability to deliver measurement solutions to South Africa, lies in its staff. Human capital is the key asset of the NMISA, and their development and the creation of a pipeline of future metrologists are high on the organisational agenda.

The organisation has grown in size as projects to develop and support national measurement standards have grown in number and depth over the years. With measurement standard demands ongoing, the organisation will continue to grow and expand to meet new and more stringent requirements, as well as putting plans in place to move into new metrology areas.

The projected growth furthermore incorporates two major components. namely enhancing the NMISA's qualification profile and addressing employment equity.

12. FINANCIAL PLAN

12.1 PROJECTIONS OF REVENUE, EXPENDITURE AND BORROWINGS

The spending focus over the MTEF period will be on providing metrology and advanced measurement assistance to specific industry sectors, as identified in IPAP, and building capacity in the institution to fulfil its mandate better.

Over the MTEF period, the NMISA is projected to grow its grant allocation funding from R202.5 million (2014/15) to R288.8 million (2017/18).

The main contributor is the additional funding that is earmarked for the recapitalisation of the institute in support of the NMS. Over the years, as baseline funding did not increase with scientific inflation (which is significantly higher than normal inflation), and funding lost from the CSIR was not fully compensated when the NMISA was established, available funding for capital investments in equipment for hosting the NMS, decreased drastically from 55% of the total budget in 2001/02 to an unprecedented low level of 4% in 2010/11. This would have resulted in the discontinuation and abandonment of some NMS, which is in contravention with the entity's mandate. To avert such a situation, the organisation has embarked on a drive to recapitalise its operations by growing the budget from R145.9 million for the 2013/14 financial year to R288.8 million in 2017/18, at an average growth rate of 45% from the allocated baseline.

The investment in national measurement standards will therefore take centre stage over the next four years and capital expenditure was projected to grow by 21% in 2013/14 and drop slightly to 14% in 2016/17. Furthermore, a significant amount of the funding will still be directed towards human capital capacity-building, which is currently at ~61% of the original baseline allocation. The external revenue part of the income from services rendered (calibration and analysis) is expected to remain static from R10.6 million in 2013/14 to R10.5 million in 2016/17. The main reason for this is that the organisation is currently working on strategies to expand its revenue base through higher-level services – especially in support of IPAP. Amongst others, the entity is working on initiatives to identify strategic government operations that the organisation can participate in and add more value at lower cost to the state, such as the establishment and operation of a laboratory for the National Nuclear Regulator, an Environmental Pollution Compliance and Research Centre for reference environmental monitoring, a laboratory for traceability and accurate measurement for nanotechnologies, as well as cooperation with the South African Air Quality Management Services,

The goods and services budget is projected to grow from the current R81.2 million in 2013/14 to R191.4 million in 2016/17. This amount is mainly utilised for the proper maintenance of NMS facilities that range between 5 and 25+ years in age, as well as proper maintenance of the newly acquired NMS (via recapitalisation). The other significant portion goes the recapitalisation project – i.e. the PPP Project, registered with the National Treasury, as well as the rental of buildings from the CSIR and related services, which are growing at a high rate of about 13% to 15% per annum. Although the organisation is working towards building new facilities, indications are that the project will only come to fruition after the MTEF period.

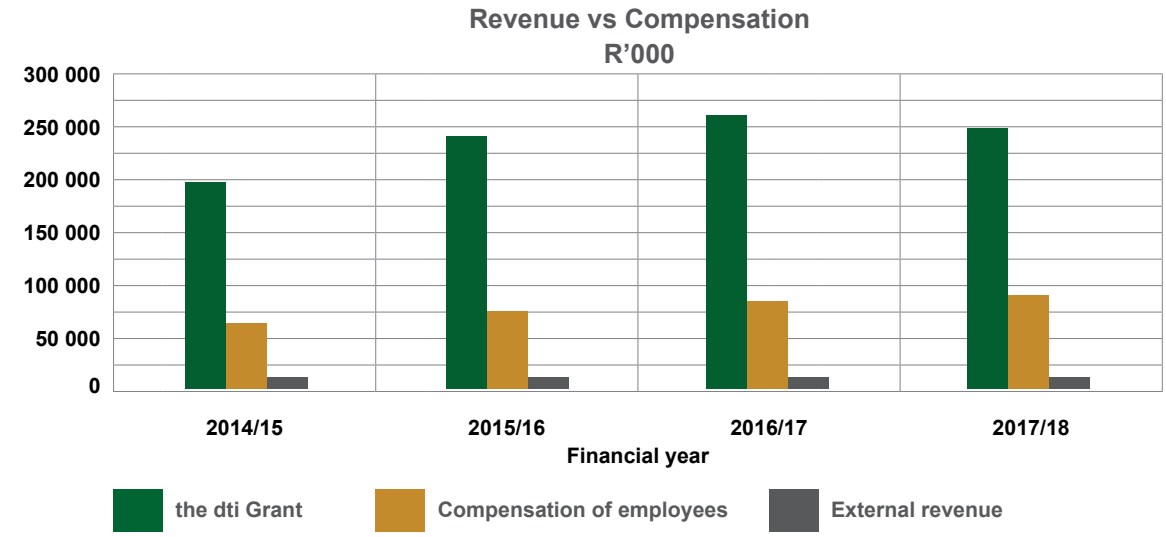


Figure 4: Revenue from the dti and external vs compensation

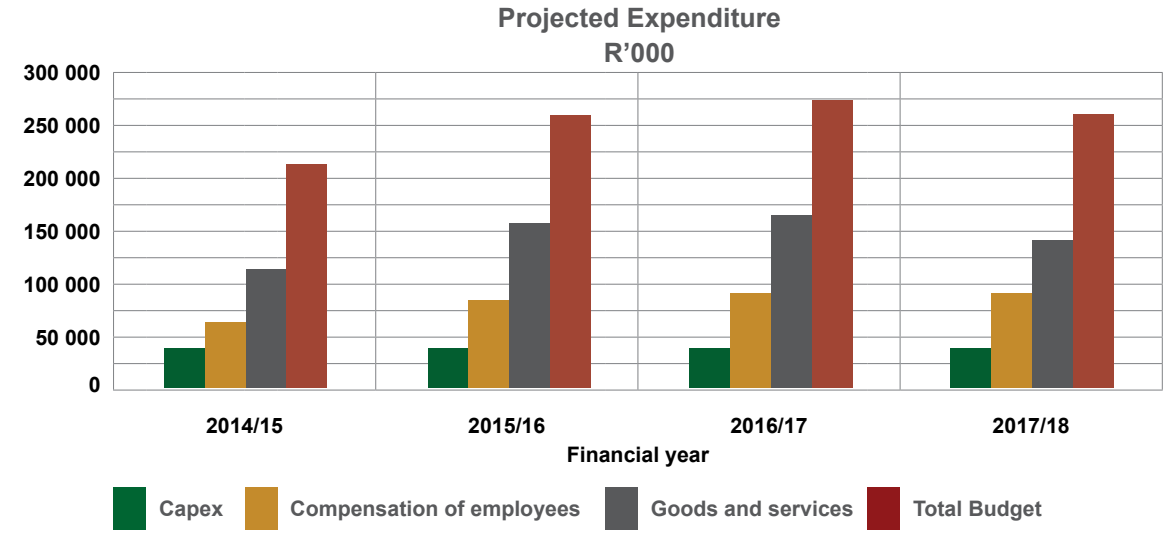


Figure 5: Projected expenditure

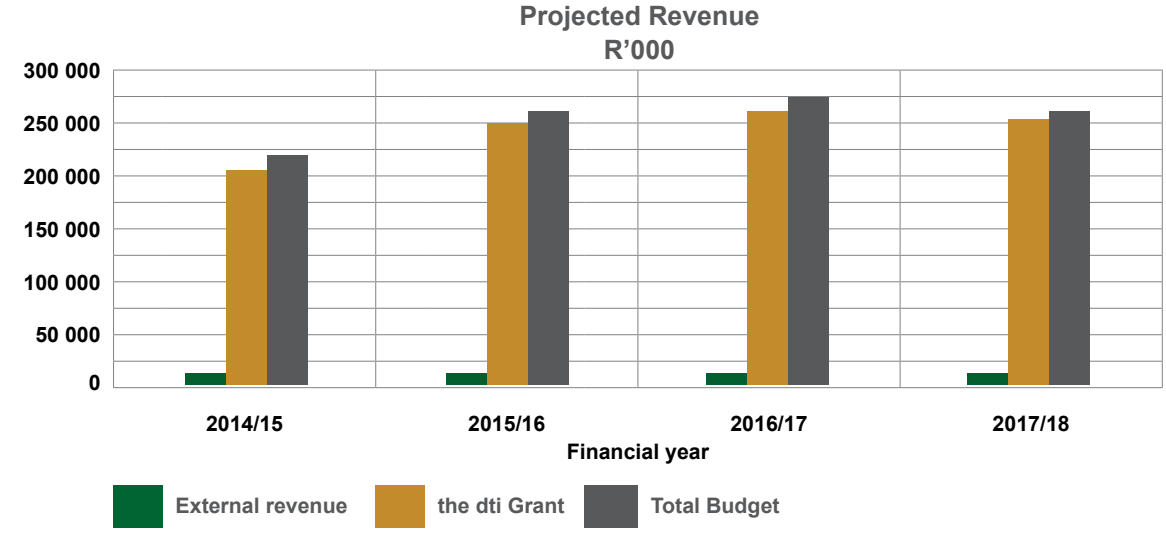


Figure 6: Projected revenue

12.2 ASSET AND LIABILITY MANAGEMENT

Financial Position	Audited Outcomes			Revised Estimate	Average Growth Rate (%)	Expenditure/ Total: Average (%)	Medium-term Estimate		
R thousand	2011/12	2012/13	2013/14	2014/15	2011/12 – 2014/15		2015/16	2016/17	2017/18
Carrying value of assets	76,775	69,361	76,006	97,723	9.5%	61.8%	127,052	165,131	214,670
of which:									
Acquisition of assets	6,682	16,877	17,194	36,244	88.4%	-24.1%	37,899	39,879	41,872
Receivables and payments	1,855	2,183	3,576	382	-2.6%	1.5%	290	310	331
Cash and cash equivalents	37,055	39,247	95,053	15,319	21.4%	36.1%	16,610	17,259	17,949
Total assets	116,242	112,124	175,550	113,424	5.9%	100%	143,952	182,700	232,029
Accumulated surplus/(deficit)	110,870	105,531	167,069	111,921	6.8%	95.8%	142,282	180,960	229,819
Trade and other payables	1,195	3,786	6,495	1,503	70.5%	2.5%	1,670	1,740	1,809
Total equity and liabilities	116,242	112,124	175,550	113,424	5.9%	100%	143,952	182,700	232,029

12.3 CASHFLOW PROJECTIONS

Cashflow Data	Audited Outcomes			Revised Estimate	Average Growth Rate (%)	Expenditure/ Total: Average (%)	Medium-term Estimate		
R thousand	2011/12	2012/13	2013/14	2014/15	2011/12 – 2014/15		2015/16	2016/17	2017/18
Cash receipts from stakeholders									
Sale of goods and services other than capital assets	7,697	8,273	10,600	8,667	4.0%	6.9%	6,646	7,301	8,016
Transfers received	87,581	82,233	145,942	202,565	32.2%	91.6%	250,895	264,193	252,803
Interest and other income	1,330	2,128	1,261	3,146	33.2%	1.5%	3,461	3,807	4,187
Total receipts	**96,608**	**92,634**	**157,803**	**214,378**	**30.4%**	**100.0%**	**261,002**	**275,301**	**265,006**
Cash paid to stakeholders									
Compensation of employees	42,871	48,187	56,007	71,500	18.6%	41.3%	79,548	85,282	87,930
Goods and services	23,234	24,537	59,385	106,623	66.2%	34.5%	141,586	146,164	128,836
Total payments	**66,105**	**72,724**	**115,392**	**178,133**	**39.2%**	**75.8%**	**221,134**	**231,446**	**216,766**
Net cashflows from operating activities	**30,503**	**19,910**	**42,411**	**36,244**	**5.9%**	**24.2%**	**39,868**	**43,855**	**48,240**
Cashflow from investing activities	**-7,061**	**-17,718**	**-35,019**	**-36,244**	**72.5%**	**-16.4%**	**-39,868**	**-43,855**	**-48,240**
Cashflow from financing activities	-	-	-	-	-		-	-	-
Net increase/ (decrease) in cash and cash equivalents	**23,442**	**2,192**	**7,392**		**100%**				

12.4 CAPITAL EXPENDITURE PROJECTS

The NMISA is currently operating with old equipment that requires frequent maintenance. The table below reflects the replacement value, as well as the value of new equipment required for the NMISA laboratories to be able to carry out its mandate within the allocated grant.

Table 2: Capital Expenditure per Division

Division	Current Equipment Value as at 31 December 2014 (Rand)	Estimated Value of Maintenance, Upgrades and Replacements (Rand)	Estimated Value of New Equipment (Rand)
All the NMISA	79 796 319	61 839 600	92 759 400

12.5 INFRASTRUCTURE PLANS: RECAPITALISATION

In the MTEF allocations for 2013/14 to 2015/16, and on the recommendation of the Minister's Committee on the budget, an additional budget was approved by Cabinet for the NMISA on 23 November 2011, towards the improvement of national measurement standards: R50 million in 2013/14; R100 million in 2014/15 and R104 million in 2015/16, respectively.

PART B: PROGRAMME PERFORMANCE

13. MAINTENANCE OF THE NATIONAL MEASUREMENT STANDARDS

13.1 PURPOSE OF THE PROGRAMME

The maintenance, development and improvement of the national measurement standards is mandated in the Measurement Units and Measurement Standards Act, 2006 (Act No. 18 of 2006) (the Measurement Act), which was promulgated 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 standards (NMS) and units, as well as to provide for the keeping and maintenance of the NMS and units.

The balanced scorecard was structured to align the seven goals of the organisation with 12 objectives, so as to ensure clear outputs that could be assessed against performance management criteria.

13.2 DESCRIPTION OF THE PROGRAMME

An updated performance matrix, which can be seen below, covers the period 2015/16 to 2017/18.

The NMISA adopted the balanced scorecard approach to set and measure performance targets. This scorecard addresses the maintenance of the national measurement standards and the administrative support provided to ensure the outputs of the organisation. Four key components are being addressed, namely international agreements and participation; stakeholders/customers (technical); organisational development (learning and growth); and a financial and business process perspective.

International obligations: The NMISA provides for the use of the measurement units of the SI and certain other units, the designation of national measurement standards and units, as well as for keeping and maintaining the national measurement units and standards. These also include improving existing NMS and methods, developing new NMS, secondary standards and new reference methods.

International participation and equivalence: As part of the Metre Convention System, the NMISA ensures international measurement comparability by participating in the activities of the CIPM. These include active participation in the consultative committees and demonstrated measurement capabilities as published in the BIPM Key Comparisons Database (KCDB).

Internal organisation (learning and growth) perspective: The internal growth perspective addresses human resources, thereby demonstrating the organisation's capacity to deliver on its mandate by maintaining a skilled, competent and transformed workforce. Key priorities include the following:

- Improving core skills and qualifications
- Reducing employee turnover
- Transformation
- Improving job satisfaction
- Improving internal communications in the HR function

Stakeholder/customer perspective (technical): It includes scientific and technical outputs, as well as products and services developed to support the South African commerce and industry in a fast-paced global economy.

Financial and business process perspectives: The focus is on the financial performance and sustainability of the organisation. Key priorities that are addressed include the following:

- Financial growth and stability is ensured by broadening the revenue mix
- Effective financial controls
- Developing and updating policies and procedures
- Improving internal processes; aligning and integrating systems and processes
- Improving internal communication
- Establishing long-term multi-divisional research programmes
- Implementing systems to manage and protect the NMISA's intellectual property.

The performance indicators of the balanced scorecard are supported by divisional annual performance plans and deliverables. The main activities, in line with the strategy that has been presented to attain these key performance indicators, are summarised in Annexure A.

Note: Annual Targets: While annual targets are not recommended in the framework document, some key metrology targets can only be claimed annually due to procedural constraints. Annual targets have been kept to a minimum.

13.3 PERFORMANCE INDICATORS AND PERFORMANCE TARGETS PER PROGRAMME

13.3.1 National Obligations

As mandated, the NMISA provides for the use of the measurement units of the International System of Units and certain other units, the designation of national measurement standards and units and for keeping and maintaining the national measurement units and standards. These also include improving existing national measurement standards and methods, as well as developing new national measurement standards, secondary standards and new reference methods.

Strategic Outcomes-oriented Goal 1	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
Keep, maintain and develop the national measurement standards and provide for the use of the national measure-ment units	Provide for the national measurement units by maintaining the SI units, units outside the SI and equivalents of units	1	Update South Africa, through the dti, on units defined by the CIPM (SI); advise on the use of units outside the SI; and maintain equivalents of units	Gazetted National Measurement Units	New KPI	New KPI	New KPI	Update Schedule 1 (SI units) and submit to the dti to Gazette	R 100	Update Schedule 2 (Other units) and submit to the dti to Gazette	Update Schedule 3 (Equivalents of units) and submit to the dti to Gazette	Develop and submit annual report to the dti on the SA measurement units	Annual target
	Maintain the Schedule of National Measurement Standards	2	Maintained National Measurement Standards	Number of national measurement standards maintained submitted to the dti to Gazette	50	50	50	52	R 23 069	53	54	55	Annual target with quarterly progress reported
	Keep, maintain and develop measurement systems for bringing national measurement standards and reference methods into being	3	Improved and new national measurement standards, secondary standards, reference materials and methods	Number of improved and new national measurement standards and secondary standards, reference materials and methods	7	5	10	13	R 15 0379	15	15	17	Annual target with quarterly progress reported

13.3.2 National Equivalence

As part of the Metre Convention System, the NMISA ensures international measurement comparability by participating in the activities of the International Committee for Weights and Measures. These include active participation in the consultative committees and demonstrated measurement capabilities, as published on the International Bureau of Weights and Measures (BIPM) Key Comparisons Database (KCDB).

Strategic Outcomes-oriented Goal 2	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
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	4	Membership of and active participation in the CIPM and its consultative committees (CCs)	Number of membership of International committee for Weights and Measures CIPM and Consultative Committees (CC)	9	9	9	10	R 3 600	10	10	10	Annual target
	Establish confidence in the accuracy of the national measurement standards by suitable and documented quality and management system	5	An internationally accepted quality system through SANAS accreditation	Number of accredited laboratories accredited to ISO 17025 or ISO Guide 34 and/or maintained quality system	New KPI	New KPI	New KPI	New KPI (Maintain QS status)	R 1 200	19	21	22	Reported per quarter
	To maintain the calibration and measurement capability (CMC) claims in KCDB as evidence of South Africa's measurement capability	6	Demonstrated measurement capabilities through published CMCs	Number of CMCs as published in the Key Comparison Database (KCDB)	362	366	382	As published in KCDB (376)	R 14 459	411	417	425	Annual target (BIPM KCDB)

13.3.3 Recapitalisation and Modernisation of the NMISA

Recapitalise and modernise the NMISA to ensure that the national measurement standards support international trade and health, as well as environmental and safety requirements by providing for an appropriate infrastructure to serve the measurement needs of South Africa and to replace obsolete equipment and acquire modernised equipment for higher order measurements.

Strategic Outcomes-oriented Goal 3	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
To modernise the NMISA's infrastructure and equipment through recapitalisation	Recapitalise and modernise the NMISA to ensure that the national measurement standards support international trade, health, environmental and safety requirements	7	A newly designed the NMISA with an appropriate infrastructure to serve the measurement needs of South Africa (PPP Project)	Percentage of budget spent (see note*)	New KPI	New KPI	New KPI	50%	R 154 599	70%	100%	100%	Reported per quarter

Note: This addresses the percentage of the budget spent on the PPP Project. CAPEX is captured under KPI 14

13.3.4 Technical Infrastructure Support

As the foundation of the South African measurement system, the NMISA provides technical measurement expertise and support for public policy objectives, accreditation, standardisation and regulatory affairs.

Strategic Outcomes-oriented Goal 4	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
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	8	Participate in, and contribute to national technical infrastructure institutions	Number of membership of SANS STCs, ISO/ SANS Committees and NRCS regulatory bodies	20	Not measured as KPI	Not measured as KPI	35	R 1 500	44	46	46	Annual target
		9	Demonstrated competence and excellence in measurement through science outputs	Number of refereed and/or peer-reviewed papers, manuscripts, articles, application or technical notes, book chapters, etc. accepted for publication in peer-reviewed journals, books or appropriate media	31	21	18	20	R 8 500	21	24	25	Reported per quarter
				Number of presentations given at conferences, workshops and TAFs	41	50	51	41*	R 5 927	42	44	45	Reported per quarter

**The target for 2014/15 was decreased due to a cut in the overseas travel budget. The focus is now on national and the 41 has already been exceeded in Q2 of 2014/15*

13.3.5 Organisational (learning and growth) Perspective

The NMISA strives to support the technical infrastructure by providing measurement knowledge and expertise – and a key function is reflected in its scientific and technical outputs. The Human Resources Department developed measures to increase core skills and staff capability, reduce employee turnover and ensure a fair and equitable workforce. Included are targets to develop and increasing the pipeline of technical staff, as well as increasing the qualification profile to foster more R&D on par with developed metrology institutes.

Strategic Outcomes-oriented Goal 5	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
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	10	Skilled, competent and transformed the NMISA personnel	Number of post-graduate and undergraduate bursars	9	11	8	10	R 15 850	10	12	12	Annual target
				Training expenditure as a % of personnel cost	1.5%	2%	2%	2%		2%	2%	2%	Annual target with quarterly progress reported
				Number of interns and in-service trainees hosted	5	5	5	7		8	10	10	Annual target with quarterly progress reported
				Percentage of funded vacancies	New KPI	New KPI	New KPI	10%		9%	8%	7%	Annual target

**The NMISA was excluded from the list as a science council and cannot access NRF funding, so the number dropped*

13.3.6 Stakeholder and Customer Perspective

With regard to its stakeholders and customer perspective, the NMISA ensures dissemination to industry via traceability, measurement expertise and services. Technical key performance areas and outputs were developed for each strategic objective of the organisation.

Strategic Outcomes-oriented Goal 6	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
Provide essential support to South African public and private enterprises through dis-semination 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	11	Dissemination of NMS and measurement capabilities	Income generated from dissemination activities	New KPI	R 11 690m	R 10 083m	R 8 667m	R 9 534	R 9 534m	R 10 487m	R 11 536m	Reported per quarter
		12	External client satisfaction	Percentage of complaints from customer satisfaction surveys per total jobs	New KPI	<10%	<10%	≤ 5%	R 50	≤ 5%	≤ 5%	≤ 5%	Reported per quarter
	Provide appropriate technology and skills transfer to the South African industry, especially to SMEs	13	A skilled and capable labour force for measurements in industry	Number of industry and/ or regional metrologists trained in accurate measurement	12	14	49	55	R 1 876	58	59	63	Reported per quarter
				Number of courses presented to industry	New KPI	5	6	13		14	14	17	Reported per quarter

***Note:** Income from additional research proposals to donors will be monitored and progress reported to **the dti** per quarter and the Technical Sub-committee meeting of the Board.*

13.3.7 Financial and Business Perspectives

These perspectives include measures that ensure effective financial controls, financial growth and stability; improve the quality of internal processes; and align and integrate systems and processes.

Strategic Outcomes-oriented Goal 7	Strategic Objectives	KPI	Key Performance Outputs	Key Performance Indicator/ Measure	2011/12	2012/13	2013/14	2014/15 Baseline	2015/16 Budget R'000	2015/16 Targets	2016/17 Targets	2017/18 Targets	Reporting Milestone
Adhere to the regulatory requirements of a type 3A public entity and sound corporate governance	Comply to government directives, the PFMA, treasury regulations and regulatory issues in terms of Government regulations	14	Establish systems and processes to ensure compliance to regulatory frameworks	Percentage of revenue received expensed	New KPI	New KPI	New KPI	98%	R 3 315	98%	98%	98%	Annual target with quarterly progress reported
				Percentage of total budget spent on CAPEX	New KPI	10%	10%	20%		20%	20%	20%	Annual target with quarterly progress reported
		15	Reasonable assurance on the adequacy, effectiveness efficiency of internal controls, risk management and governance matters	100% completed Annual Audit Plan	6*	30*	100%	100%	R 1 500	100%	100%	100%	Reported per quarter

An unqualified audit opinion as a key performance indicator/measure has been removed from KPI 14, due to the fact that an unqualified audit opinion is an implied outcome of effective and efficient financial reporting processes and procedures. Measures are in place to ensure that the outcome is achieved. An interim external audit was held during November 2014, which highlighted matters on which remedial action should be taken.

Total budget: R260 429 000 (Current budget: R96 296k+Recapitalisation: R154 599k+Revenue: R9 534K).

13.4 QUARTERLY MILESTONES (2015/16)

As per section 13.3

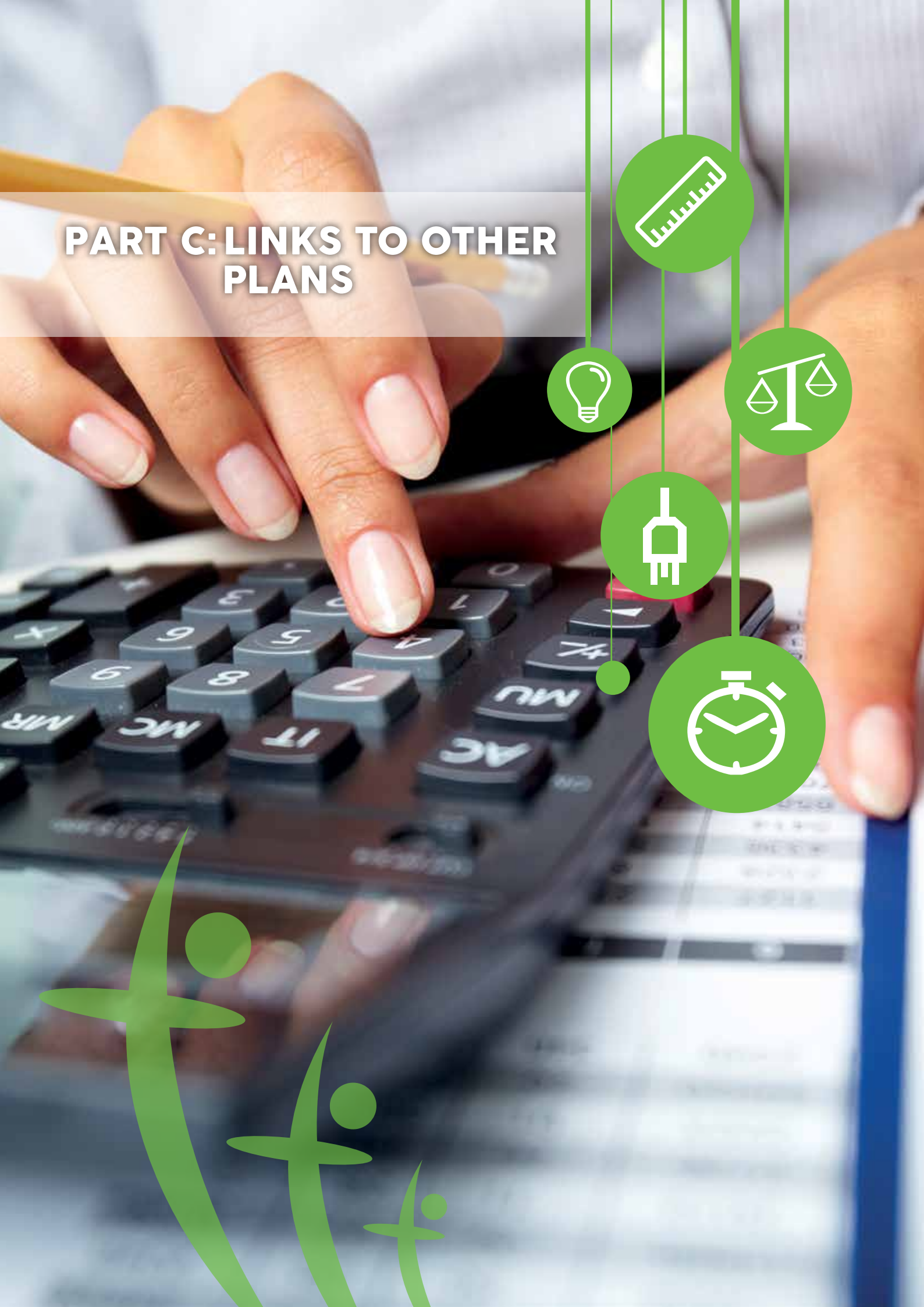
KPI	Performance Indicator/Measure	2014/15 Baseline	2015/16 Annual Target	Quarterly Milestones				Reporting Milestone
				1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
1	Gazetted National Measurement Units	Update Schedule 1 (SI units) and submit to the dti to Gazette	Update Schedule 2 (Other units) and submit to the dti to Gazette	Draft schedule 2	Consult with NRCS on draft schedule 2	Consult with industry on draft schedule 2	Submit to the dti to Gazette 2	Annual target (Schedule 2 submitted to the dti)
2	Number of national measurement standards maintained, submitted to the dti to Gazette	52	53	52 maintained	52 maintained	52 maintained	52 maintained and 1 new gazetted	Annual target with quarterly progress reported
3	Number of improved and new national measurement standards and secondary standards, reference materials and methods	13	15	15				Annual target with quarterly progress reported
4	Number of membership of International Committee for Weights and Measures, CIPM and consultative committees (CCs)	10	10	10				Annual target
5	Number of accredited laboratories accredited to ISO 17025 or ISO Guide 34 and/or maintained quality system	New KPI (Maintain QS status	19	19				Annual target
6	Number of CMCs as published in the Key Comparison Database (KCDB)	As published in KCDB (376)	411	As published in KCDB	As published in KCDB	As published in KCDB	As published in KCDB	Annual target (BIPM KCDB)
7	Percentage of budget spent	50%	70%	70%				Annual target but reported per quarter
8	Number of membership of SANS STCs, ISO/ SANS Committees and NRCS regulatory bodies	35	44	44				Annual target
9	Number of refereed and/or peer-reviewed papers, manuscripts, articles, application or technical notes, books, chapters, etc., accepted for publication in peer-reviewed journals, books or appropriate media.	20	21	2	3	5	11	Reported per quarter
	Number of presentations given at conferences, workshops and TAFs	41	42	5	7	12	18	Reported per quarter
10	Number of postgraduate and undergraduate bursars	10	10	10				Annual target with quarterly progress reported
	Training expenditure as a % of personnel cost	2%	2%	2%				Annual target with quarterly progress reported
	Number of interns and in-service trainees hosted	7	8	8				Annual target with quarterly progress reported
	Percentage of funded vacancies	10 %	9 %	9 %				Annual target
11	Income generated from dissemination activities	R 8 667K	R9 534K	R 2 089K	R 2 678K	R 2 089K	R 3 178K	Reported per quarter

KPI	Performance Indicator/Measure	2014/15 Baseline	2015/16 Annual Target	Quarterly Milestones				Reporting Milestone
				1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
12	Percentage of complaints from customer satisfaction surveys per total jobs	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	Reported per quarter
13	Number of industry and/or regional metrologists trained in accurate measurement	55	58	8	16	17	17	Reported per quarter
	Number of courses presented to industry	13	14	3	3	3	5	Reported per quarter
14	Percentage of revenue received expensed	98 %	98 %	98 %				Annual target but reported per quarter
	Percentage of total budget spent on CAPEX	20 %	20 %	20 %				Annual target but reported per quarter
15	100% completed Annual Audit Plan	100 %	100 %	100 %	100 %	100 %	100 %	Reported per quarter

13.5 FINANCIAL PLAN (EXPENDITURE ESTIMATES FOR PROGRAMME 1)

Economic Classification	Expenditure Outcome		Adjusted Appropriation			Medium-term Expenditure Estimate	
	2011/12 R '000	2012/13 R '000	2013/14 R '000	2014/15 R '000	2015/16 R '000	2016/17 R '000	2017/18 R '000
Current payment							
Compensation of employees	42,871	48,187	50,534	64,900	71,390	75,529	86,382
Goods and services, etc.	36,453	36,335	47,715	149,478	192,728	203,077	218,292
Payments of capital assets							
Building and other fixed structures	1,792	-	64	-	-	-	-
Machinery and equipment	82,970	68,465	76,007	77,527	79,078	80,659	82,272

PART C: LINKS TO OTHER PLANS



14. ASSET MANAGEMENT PLAN

Asset verification is performed biannually and the process of determining the completeness of the fixed asset register and the existence of assets is in progress. A final asset verification will be performed at year-end, which will include a re-assessment of the useful life of assets and the possible recognition of an impairment loss. Assets are currently manually verified from the existing barcoding, but future plans incorporate the use of software as an asset management tool for the asset count and verification. A dedicated assistant account, asset management, is employed for maintaining the fixed asset register and calculating the monthly depreciation, as well as monitoring the existence and condition of the assets.

15. INFORMATION TECHNOLOGY PLAN

The Information Technology Section has just completed the implementation of its infrastructure upgrade, by investing in Server Virtualisation. The next step is to implement Virtual Desktop Infrastructure to effectively manage the organisation's desktops and laptops. The introduction of a Storage Area Network now means that the section can embark on two new projects, namely Business Continuity Management and Records Management. The Business Continuity Project will ensure compliance with IT, where the NMISA will have a dedicated Disaster Recovery Centre Offsite, which can be easily enabled in case of catastrophic disasters.

The IT Section is also planning the deployment of a Voice Over Internet Protocol (VOIP) to upgrade its Telephony Infrastructure. This would enable the NMISA to benefit from voice and video conferencing, as well as getting a better return on investment on its currently outdated Telephony Implementation.

Operations within the IT Section will be effectively managed by implementing Microsoft's Systems Centre, thereby also assisting in migrating its current Quality System Action Request System to a Service Management Module within the System Centre for effective Business Intelligence and Audit Tracking.

16. RISK MANAGEMENT AND FRAUD PREVENTION PLAN

16.1 RISK MANAGEMENT PROCESS

The NMISA adheres to a disciplined and integrated approach towards risk management that supports the alignment of strategy, process, people and technology, and allows the organisation to identify, prioritise, and effectively manage its critical risks. By understanding all its risks in an integrated framework, the NMISA can properly execute strategies to successfully achieve its goals and objectives, and to meet its set performance targets.

16.1.1 Risk Assessment Approach

16.1.1.1 Identification of Risks

Risk is defined as *"The possibility of an event occurring that will have an impact on the achievement of objectives, measured in terms of impact and likelihood"*. All risks, including financial risks (loss of assets); compliance risks (laws, regulations and policies); risks impacting on the reputation of the NMISA; as well as any other risks (such as political, external, litigation risks, etc.) were considered.

16.1.1.2 Rating of Risks

Relative ratings were allocated to each specific risk on the following scales:

a) Likelihood *(the probability of the occurrence of the risk event)*
b) Impact *(the potential effect on the organisation of the risk event).*

Rating is on a scale from 1 to 5.

Likelihood

Likelihood is the probability that the identified risk will occur within a specified period of time, before taking into account existing mitigating controls, rated as follows:

Likelihood Rating	Measurement Criteria	Qualification Criteria
Almost Certain 5	The risk is already occurring or has a high likelihood of occurring more than once during the next 12 months	The risk is almost certain to occur under the current circumstances
Likely 4	The risk will easily occur and is likely to occur at least once during the next 12 months	More than an even chance of occurring
Possible 3	There is an above average chance of the risk occurring more than once during the next three years	Could occur often
Unlikely 2	The risk has a low likelihood of occurring during the next three years	Low likelihood, but could happen
Rare 1	The risk is unlikely to occur during the next three years	Not expected to happen – the event would be a surprise

Impact

Impact is the potential loss to the organisation, should the risk materialise, rated as follows:

Impact Rating	Continuity of Service Delivery	Safety & Environmental	Technical Complexity	Financial
Catastrophic (Note: Also considered as Critical) 4	A risk event will result in a widespread and lengthy reduction in continuity of service delivery to customers for a period longer than 48 hours.	Major environmental damage. Serious injury (permanent disability) or death of staff members or members of the public. Major negative media coverage.	Use of unproven technology for critical system / project components. High level of technical interdependencies between system components.	Could result in the termination of business activities
Critical 4	A reduction in service delivery or a disruption over a significant area for a period ranging between 24 and 48 hours.	Significant injury of staff members or members of the public. Significant environmental damage. Significant negative media coverage.	Use of new technology not previously utilised by the organisation for critical systems / project components.	Increase in costs/ Decrease in revenue > 10%

Impact Rating	Continuity of Service Delivery	Safety & Environmental	Technical Complexity	Financial
High 3	A reduction in service delivery or a disruption over a regional area for a period between 8 and 24 hours.	Lower level environmental, safety or health impact. Negative media coverage.	Use of unproven or emerging technology for critical systems / project components.	Increase in costs/ Decrease in revenue: 5% - 10%
Moderate 2	A brief local inconvenience (work around possible). Loss of an asset with a minor impact on operations.	Little environmental, safety or health impact. Limited negative media coverage.	Use of unproven or emerging technology for systems / project components.	Increase in costs/ Decrease in revenue < 5%
Low 1	No impact on business or core systems.	No environmental, safety or health impact and/or negative media coverage	Use of unproven or emerging technology for non-critical systems / project components.	Minimal or no impact on costs/ revenue

16.1.1.3 Inherent Risk

Inherent risk is defined as the exposure arising from risk factors in the absence of deliberate management intervention(s) to exercise control over such risk factors. Inherent risk rating = impact x likelihood (in the absence of mitigating controls)

Description	Thresholds	Threshold Interpretation
Catastrophic/ Critical	Between 16 and 25	Unacceptable – Very High Inherent Risk
High	Between 11 and 15	Unacceptable – High Inherent Risk
Moderate	Between 6 and 10	Cautionary – Medium Inherent Risk
Low	Between 1 and 5	Acceptable – Low Inherent Risk

16.1.1.4 Residual Risk Rating Scales

Description	Thresholds	Suggested Action	Suggested Timing
Catastrophic/ Critical	Between 16 and 25 – Unacceptable	Management should take immediate action to reduce risk exposure to an acceptable level.	Immediate action required.
High	Between 11 and 15 – Cautionary to Unacceptable	Management should take immediate action and constantly monitor the risk exposure and related control adequacy.	Immediate action to medium-term action, within three months.
Moderate	Between 6 and 10 – Cautionary	Management should constantly monitor the risk exposure and related control adequacy..	Medium-term, within three months.
Low	Between 1 and 5 – Acceptable	Management may consider reducing the cost of control.	Monitor, no action required.

16.1.1.5 Periodic Review of Risks

At least once a year the NMISA will undertake a thorough re-assessment of its risks.

16.2 RISK REGISTER

A risk register, identifying the top organisational risk, appears in SECTION 20, ANNEXURE B

16.3 FRAUD PREVENTION PLAN

16.3.1 Introduction

The NMISA acknowledges the fact that the incidence of economic or commercial crime is an increasing phenomenon and has become an integral part of the current corporate and business environment. In this regard, the entity commits itself to –

- become one of those participants in the economy that will actively and proactively protect all of its assets against threats of crime like fraud, corruption, theft, bribery and others; and
- to pursue and bring to justice any perpetrator, whether inside or outside the NMISA, who commits any criminal activities against assets or interest of the organisation.

Apart from material financial implications, economic crime has further detrimental effects on organisations, such as loss of reputation, the undermining of competitiveness and the erosion of credibility. The NMISA subscribes to the national drive to eradicate fraudulent activities and has adopted a strategic approach to the management of economic crime prevention, detection and resolution by:

- unequivocally communicating to internal and external stakeholders its stance against, and its policy to prevent and deal with instances of economic crime;
- practising and upholding good corporate governance;
- developing and instituting an ethical business environment that will cultivate an anti-crime culture within the entity;
- conducting regular assessments to identify risks;
- adopting a risk-based audit approach;
- strengthening internal controls;
- implementing proper fraud reporting and whistle-blowing structures; and
- developing a fraud response plan.

16.3.2 Policy Stance

The NMISA is committed to protecting all the monetary, physical and human assets under its custodianship from attempts by any individual to gain a financial benefit or otherwise in an unlawful, dishonest or unethical manner.

All individuals within, and dealing with the NMISA, must believe that:

- the entity is honest and ethical in its business dealings;
- they are treated with respect, rewarded and disciplined in a fair and just manner;

- the fight against commercial crime is of paramount importance to the organisation, that they are part of that fight and that their efforts will be acknowledged;
- a stance of zero tolerance will be taken against any employee who commits a crime;
- violations will be investigated and disciplinary action and/or criminal prosecution will be instituted; and
- board members and management are bound by the same ethics.

The Audit and Risk Committee, established in terms of the Public Finance Management Act, 1999 (Act No. 1 of 1999) (the PFMA), will be responsible for the administration, revision and interpretation of the Fraud Prevention Plan. It is therefore the responsibility of each EXCO member to ensure that potential fraud risks, pertaining to his/her functional area of responsibility, are continuously monitored and managed.

The Fraud Prevention Committee, which will be constituted as a special task team from time to time, will consist of the Chief Executive Officer, Chief Financial Officer, HR Manager, Compliance and Corporate Governance Manager, and Internal Audit will be convened on an ad hoc basis to deal with any matters that may require immediate action.

All instances of fraud, alleged fraud or similar irregularities will be pursued via thorough investigations and, if guilt is established:

- appropriate disciplinary action will be taken against any perpetrator;
- criminal prosecution will be initiated if appropriate;
- civil action will be instituted if appropriate; and
- any other appropriate legal action or remedy will be initiated.

If any employee has any doubt regarding a questionable situation that may arise, such employee should immediately consult with any member of the Fraud Prevention Committee.

17. MATERIALITY FRAMEWORK

17.1 INTRODUCTION

In terms of the Treasury Regulation 28.3.1, Accounting Authorities must, “for purposes of material [section 55(2) of the Act] and significant [section 54(2) of the Act] develop and agree on a framework of acceptable levels of materiality and significance with the relevant executive authority.”

The NMISA is required by law to operate within the PFMA and its accompanying Treasury Regulations as a Schedule 3A public entity. The two above-mentioned sections of the Act are therefore highly significant for operational and reporting purposes, as follows:

Section 54(2) of the Public Finance Management Act 1999, (Act No. 1 of 1999) (PFMA), states that: *“Before a public entity concludes any of the following transactions, the accounting authority for the public entity must promptly and in writing inform the relevant treasury of the transaction and submit relevant particulars of the transaction to its executive authority for approval of the transaction:*

- *Establishment or participation in the establishment of a company;*
- *participation in a significant partnership, trust, unincorporated joint venture or similar arrangement;*
- *acquisition or disposal of a significant shareholding in a company;*

- *acquisition or disposal of a significant asset;*
- *commencement or cessation of a significant business activity; and*
- *a significant change in the nature or extent of its interest in a significant partnership, trust, unincorporated joint venture or similar arrangement".*

Section 55(2) of the Act requires that the Annual Report and financial statements, referred to in subsection (1) (d), must:

- *Fairly present the state of affairs of the public entity, its business, its financial results, its performance against predetermined objectives and its financial position as at the end of the financial year concerned.*
- *Include particulars of:*
  - *any material losses through criminal conduct and any irregular expenditure and fruitless and wasteful expenditure that occurred during the financial year;*
  - *any criminal or disciplinary steps taken as a consequence of such losses or irregular expenditure or fruitless and wasteful expenditure;*
  - *any losses recovered or written off;*
  - *any financial assistance received from the state and commitments made by the state on its behalf;*
  - *any other matters that may be prescribed; and*
  - *including the financial statements of any subsidiaries.*

17.2 MATERIALITY VERSUS SIGNIFICANCE

17.2.1 Materiality

In terms of Auditing and Accounting Standards (SAAS 320.03 and AC000.29) materiality is defined as information which, if omitted or misstated, could influence the economic decisions of users, taken on the basis of the financial statements. Materiality depends on the size of the item or error judged under the particular circumstances of its omission or misstatement. Thus, materiality provides a threshold or cut-off point, rather than being a primary qualitative characteristic that information must have if it is to be useful.

The NMISA assesses materiality of all its transactions from both a quantity and a quality point of view. Therefore, both the amount (quantity) and nature (quality) of information need to be considered in setting a determination of whether the event/matter is material or not.

17.2.2 Significance

The *Concise Oxford Dictionary* defines "significant" as *"extensive or important enough to merit attention".* "Significant" may, therefore, be interpreted as of relative importance to the public entity as a whole. Thus, a transaction will be significant if conducting the transaction is vitally important in order to fulfil the public entity's mandate and for it to operate effectively.

From the interpretations above, it can be seen that there is a difference between "material" and "significant". Significant is larger than material, as a significant transaction impacts on the public entity as a whole. An occurrence may be material but not necessary significant, whereas any occurrence that is significant will be material.

17.3 ANALYSIS AND APPROACH

A number of factors need to be considered when setting the materiality and significance levels within the framework. These factors include, but are not limited to the following:

17.3.1 Nature of the Business

The NMISA is mandated by an Act of Parliament to realise, develop, maintain and disseminate the national measurement standards for South Africa. These standards ultimately make it possible for South Africa to conduct trade, which requires measurement to ascertain the parameter being traded. This work is highly technical in nature and involves scientific research methodology. As such, the capital instrumentation and skillset required are complex, which somewhat increases the complexity of deciding what is material.

As a public entity, the NMISA is materially funded by public funds, as allocated by an Act of Parliament and therefore it is equally accountable to the public via the executive authority. The impact of the service delivered and the interest of the public in the operations of the organisation are of paramount importance with regard to what the entity considers and discloses as material and/or significant.

17.3.2 Statutory Requirements

Materiality and significance levels will be influenced by considerations such as legal and regulatory requirements. The NMISA considered all pertinent statutory requirements in the compilation of this framework.

17.3.3 Risk Associated with the Entity's Business

There is an inverse relationship between materiality / significance and the level of risk – that is, the lower the risk the higher the materiality / significance level and vice versa.

17.4 QUANTITATIVE AND QUALITATIVE FACTORS

Although significance may contain quantitative elements, it may require more qualitative considerations in comparison to materiality. This, in turn, requires professional judgement and particular regard for the specific transaction in the context of the entity's business as a whole. Due to the fact that the decision as to which qualitative factors should be considered in setting the significance level requires notably more professional judgement, this decision should rest directly with the entity's accounting authority, as representative body of the shareholders.

17.4.1 Nature of the Transaction

In setting a monetary value for significance, it may be practicable to differentiate between the following two types of transactions:

17.4.1.1 Transactions that are operational in nature – i.e. part of the entity's normal, everyday business

For those transactions that are operational in nature, a higher significance level may be set, as these transactions are approved within a very specific framework – i.e. the entity's corporate plan, strategic plan and / or annual budget. In this regard, the risk management limits set for these transactions may be indicative of the appropriate significance level.

17.4.1.2 Transactions that are strategic in nature – i.e. outside the entity's normal, everyday business, or transactions that are non-routine or that would impact on the business or financial position of the entity as a whole

For those transactions that are strategic in nature, a lower significance level may be set, considering the strategic impact thereof. Therefore, any transaction which, in the accounting authority's opinion, may in any way influence the decisions or actions of the executive authority or the legislature to which the entity is accountable, should be seen as significant.

It may be necessary for the entity to calculate separate materiality / significance figures, based on:

- the nature of the account balance;
- the nature of the transaction; and
- the aspect of the financial statements being considered.

17.5 ASSESSMENT AND DETERMINATION OF MATERIALITY FOR THE NMISA

17.5.1 Quantitative Materiality

The NMISA is a fairly new organisation and therefore still establishing processes and strengthening its control environment. At this stage of development, there are inherent risks associated with the first implementation of unproven processes, a lack of organisational culture and a lack of teamwork. The afore-mentioned risks must, however, be discounted by the unqualified audit report obtained by the entity over the past two years and the significance of the related audit findings.

This therefore requires the entity to set the threshold at a reasonably conservative level of the Treasury's guideline matrix.

The following guideline will be applied to the basis selected:

Basis	Guideline	% used	Rand Value per Approved Budget	Materiality Amounts
Total Revenue	0.5% - 1%	0.5	R(X)	= %used x R(X)
Total Assets	1% - 2%	1	R(X)	= %used x R(X)

The basis selected for materiality is total revenue, taking into account authority limits, audit risk, the previous year's audit findings and professional judgement.

17.5.2 Qualitative Materiality

Qualitative materiality plays an important role in the evaluation of the audit findings.

Qualitative characteristics that have been used by management to assess the materiality of an item, include the following:

- Public accountability.
- Compliance with legislation.
- Disclosure requirements.
- Reporting requirements in terms of section 5 of the Auditor General's Act.
- Sensitive situations, including irregularities, illegal and questionable transactions.
- The importance of information for the users thereof.

Considering the unique risks attributable at the income statement level and balance sheet, management therefore determines the qualitative materiality in line with the quantitative materiality.

17.5.3 Annual Review of Materiality

The materiality framework and significance levels will be reviewed each financial year by management, in line with the preparation of the Annual Performance Plan and based on the levels of risk and the adequacy of the internal controls and accounting systems.

17.5.4 Materiality and Significance Framework

The NMISA Materiality and Significance Framework, in terms of the PFMA and accompanying Treasury Regulations, is detailed in the table below.

Table 3: Main Risks of the NMISA

Applicable PFMA Section	Quantitative (Amount)	Qualitative (Nature)
SECTION 54(2) (INFORMATION TO BE SUBMITTED BY ACCOUNTING AUTHORITIES)		
Section 54(2) of the Public Finance Management Act, 1999 (Act No. 1 of 1999) (PFMA), states that "the accounting authority for a public entity must inform the Treasury and submit relevant particulars to the Minister for approval in respect of any of the following qualifying transactions:		
• *Establishment or participation in the establishment of a company [section 54(2)(a)];*	All such transactions will be considered material and discussed with the executive authority.	
• *participation in a significant partnership, trust, unincorporated joint venture or similar arrangement [section 54(2)(b)];*	All such transactions will be considered material and discussed with the executive authority.	Any unplanned event per the Annual Strategic Plan (ASP) that may affect the core purpose or mandate of the entity.
• *acquisition or disposal of a significant shareholding in a company [section 54(2)(c)];*	All such transactions will be considered material and discussed with the executive authority.	Any unplanned event per the ASP that may affect the core purpose or mandate of the entity.

Table 3: Main Risks of the NMISA (continued)

Applicable PFMA Section	Quantitative (Amount)	Qualitative (Nature)
SECTION 54(2) (INFORMATION TO BE SUBMITTED BY ACCOUNTING AUTHORITIES) (continued)		
• *acquisition or disposal of a significant asset [section 54(2)(d)];*	Any transaction of which the amount does not exceed 25% of the total assets will not be considered material.	Any unplanned event per the ASP that may affect the core purpose or mandate of the entity.
• *commencement or cessation of a significant business activity [section 54(2)(e)]; and*	All such transactions will be considered material and discussed with the executive authority.	Any unplanned event per the ASP that may affect the core purpose or mandate of the entity.
• *a significant change in the nature or extent of its interest in a significant partnership, trust, unincorporated joint venture or similar arrangement [section 54(2)(f)].”*	All such transactions will be considered material and discussed with the executive authority.	
Section 55(2) (Annual Report and financial statements) The Annual Report and financial statements referred to in subsection (1)(d) must:		
• *“Fairly present the state of affairs of the public entity, its business, its financial results, its performance against predetermined objectives and its financial position as at the end of the financial year concerned [section 55(2)(a)];*	5% of the total revenue. Using the above-mentioned guidelines, The NMISA has a material amount per the statement of financial performance and position being:	
• *Include particulars of:*		
- *Any material losses through criminal conduct and any irregular expenditure and fruitless and wasteful expenditure that occurred during the financial year [section 55(2)(b)(i)];*	Any value or qualitative aspect would be considered material.	Any unplanned event per the ASP that may affect the core purpose or mandate of the entity.
- *Any criminal or disciplinary steps taken as a consequence of such losses or irregular expenditure or fruitless and wasteful expenditure [section 55(2)(b)(ii)];*	Any value or qualitative aspect would be considered material.	
- *Any losses recovered or written off [section 55(2)(b)(iii)];*	Any value or qualitative aspect would be considered material.	
- *Any financial assistance received from the state and commitments made by the state on its behalf [section 55(2)(b)(iv)]; and*	Any value or qualitative aspect would be considered material.	
- *Any other matters that may be prescribed [section 55(2)(b)(v)].*	Any value or qualitative aspect would be considered material.	
• *Include the financial statements of any subsidiaries [section 55(2)(c)].”*	All such transactions will be considered material and discussed with the executive authority	

18. SUBSIDIARY STATUTORY BODY REPORTING TO THE NMISA

None.

19. SERVICE DELIVERY IMPROVEMENT PLAN

Service Category	Current Service Delivery	Improvement
Calibration	Calibration of standards for regional NMIs and accredited calibration laboratories in South Africa for all parameters offered by the NMISA. Average turnaround time of 2 to 4 weeks, depending on the parameter. Provide calibration services to specialised industries that are not available at SANAS-accredited laboratories.	Expand calibration services to parameters not currently offered by the NMISA and/or improve the uncertainty regarding measurement (accuracy) of current service offered, which is needed for IPAP, regulatory and regional NMIs. Specifically assist SMEs with the potential to export. Improve average turnaround time with 10%.
Reference Measurements	Reference measurements for organic persistent pollutants, metals in maize, thin film thickness, particle size, gas mixture composition. Average turnaround time of 1 to 4 weeks.	Expand capabilities to include dioxins, binary alloy composition, metals in wheat and other food products. Improve turnaround time with 10%.
Proficiency Testing Schemes	Operating 6 PT schemes and assigning values to another 4 to 6 annually.	Further collaborate with SANAS and NLA to collectively offer PT schemes needed by the accredited laboratories in the country and region.
Provision of Certified Reference Materials	Providing CRMs for gas mixtures and alcohol analysis. Provide reference measurement to the manufacturing industry to enable the industry to prove compliance with international standards.	Expand the CRM offering to food matrix CRMs and expand the range of primary gas mixtures to include multi-component PRGMs.
Certification	The NMISA value-assigned working standards for police forensics, radioactive solutions and gas producers.	Further assist police forensics to value-assign matrix standards.
Consultation	Assists regional NMIs with the development of infrastructure, human capital development and traceability.	Assists projects of national priority with measurement issues (SKA, metal beneficiation, aerospace, green development projects, nuclear power generation, etc.)
Courses	The NMISA experts assist with the compilation and continued improvement of NLA courses in Uncertainty of Measurement and Metrology Doctrines.	Develop courses specifically targeted at SME measurement needs.
Training Industry Metrologists/ Scientists	The NMISA trains 50 to 60 national and regional metrologists per year.	Expand training in measurement to scientists from academia and working on large infrastructure projects
Networking	The NMISA has an extensive network with NMIs regionally and internationally.	Expand network to include role-players in national infrastructure projects.
Information and Communication	Website, stands at Business Expos and local conferences. Publications in scientific journals	Place articles on the role of the TI and specifically measurement, in popular publications.
SMEs	The NMISA developed a Measurement Toolkit, an Introduction to metrology DVD and trains SMEs in basic measurement.	Expand metrology DVD to include virtual training, calibrate equipment for SMEs with the potential to export and train metrologists at SMEs.
Bursar Pipeline and Internships	Annually, 5 to 7 postgraduate and 3 undergraduate bursaries in the basic sciences and engineering, as well as 5 to 7 interns.	Extend bursary programme to include more undergraduates, get recognised as a Science Council to be able to place PDPs and source funding for more bursars and interns.

20. ANNEXURE A: INDICATOR PROFILES

A summary of Performance Indicators, developed for the NMISA, appears in Table 4, with a more detailed overview in the following sections.

Table 4: Performance Indicators

Number	Indicator Description	Strategic Outcomes-oriented Goal
1	National measurement units	Keep, maintain and develop the national measurement standards and provide for the use of the national measurement units
2	National measurement standards gazetted	
3	Number of improved and new national measurement standards and secondary standards, reference materials and methods	
4	Continued membership of CIPM and its CCs	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)
5	Accredited and/or maintained quality system	
6	Number of CMCs published in the KCDB	
7	Percentage of PPP projects completed	To modernise the NMISA's infrastructure and equipment through recapitalisation
8	Participate in, and contribute to national technical infrastructure institutions	Provide measurement knowledge and expertise as a key component of the technical infrastructure with regard to public policy objectives and measurement compliance issues in terms of health, safety and the environment
9	Demonstrated competence and excellence in measurement through science outputs	
10	Skilled, competent and transformed the NMISA personnel	Provide an integrated human capital development programme for metrology
11	Dissemination of NMS and measurement capabilities	Provide essential support to South African public and private enterprises through dissemination of the national measurement standards, units and expertise
12	External client satisfaction	
13	Skilled and capable labour force for measurements in industry	
14	Financial system to ensure compliance to regulatory frameworks	Adhere to the regulatory requirements of a type 3A public entity and sound corporate governance
15	Internal Audit controls	

20.1 DETAILED INDICATOR DESCRIPTIONS

Indicators were defined in accordance with the Framework for Strategic Plans and Annual Performance Plans document, published by the National Treasury.

Indicator Output	National Measurement Units
INDICATOR KPI 1: NATIONAL MEASUREMENT UNITS	
Short definition	Update South Africa through the dti on units defined by the CIPM (SI), advice on the use of units outside the SI and maintain equivalents of units
Purpose/Importance	Legislative mandate of the NMISA
Source/Collection of data	The NMISA draft schedules, associated with the National Measurement Units, submitted to the dti for publication in the Government Gazette
Method of calculation	Simple count
Baseline	Current Gazetted Schedule of National Measurement Units
Target and target date for the indicator (31 March 2016)	Review and update Gazette at least every five years
Data limitation	Published Gazette is sent to the Minister of the dti. Final sign-off outside the NMISA control
Quality Assurance Strategy	Periodically reviewed against the updates of the SI units, units outside the SI and equivalents of units
Type of indicator	Output

Indicator Output	National Measurement Units
INDICATOR KPI 1: NATIONAL MEASUREMENT UNITS (continued)	
Calculation type	Non-cumulative
New indicator	Yes
Reporting cycle	Annual
Desired performance	Adherence to the Act, ensuring that the South African measurement units are internationally equivalent
Indicator responsibility	Director RTD
INDICATOR KPI 2: NATIONAL MEASUREMENT STANDARDS	
Short definition	Number of gazetted national measurement standards
Purpose/Importance	Legislative mandate of the NMISA
Source/Collection of data	Gazetted Schedule of National Measurement Standards
Method of calculation	Gazetted NMS categories (per parameter) are counted as per 1a, b, 2a, b, c, etc., in the schedule, except where it is a definition
Baseline	52 gazetted
Target and target date for the indicator (31 March 2016)	One new to be gazetted and 52 to be maintained
Data limitation	Request to gazette new standards is sent to the Minister of the dti. Final sign-off outside the NMISA control
Quality Assurance Strategy	The National Measurement Standard Report should document the regional, local or international benchmarking exercise through comparisons with, and/or a calibration to another national or international standard
Type of indicator	Output
Calculation type	Non-cumulative
New indicator	No
Reporting cycle	Annual
Desired performance	Meeting annual target, as it is part of a long-term growth trend
Indicator responsibility	Technical divisions
INDICATOR KPI 3: NEW AND IMPROVED NATIONAL MEASUREMENT STANDARDS	
Short definition	Improved and new national measurement standards, secondary standards, reference materials and methods
Purpose/Importance	Legislative requirements for the NMISA
Source/Collection of data	New NMS and/or procedure and/or validation report developed to the point of completed verification/validation as evidence in an NMI report and/or the Chemistry Reference Materials and Measurements Register
Method of calculation	Simple count
Baseline	13
Target and target date for the indicator (31 March 2016)	15
Data limitation	Entries must conform to a set of rules, such as verification/validation and, in some instances, international benchmarking of capabilities. Final benchmarking reports at international level can be delayed if there are disputes, but will not inhibit publishing the new procedure or improved procedure in the Chemistry Register once it is ready for dissemination to industry
Quality Assurance Strategy	The process is underpinned by accreditation to ISO 17025 and/or ISO Guide 34
Type of indicator	Output
Calculation type	Non-cumulative
New indicator	No
Reporting cycle	Annual

Indicator Output	National Measurement Units
INDICATOR KPI 3: NEW AND IMPROVED NATIONAL MEASUREMENT STANDARDS (continued)	
Desired performance	Does not necessarily increase from year to year. This indicator is in response to industry requirements from year to year, for new CRMs and reference methods to be developed and for NMS to be improved
Indicator responsibility	Technical divisions
INDICATOR KPI 4: MEMBERSHIP OF CIPM AND ITS CCS	
Short definition	Membership of and active participation in the CIPM and its consultative committees (CCs)
Purpose/Importance	Legislative mandate of the NMISA
Source/Collection of data	CC membership as listed on the BIPM website, plus membership of the CIPM
Method of calculation	Simple count
Baseline	10
Target and target date for the indicator (31 March 2016)	10
Data limitation	Withdrawal of participation in a CC due to lost competence
Quality Assurance Strategy	Demonstrated expertise qualifies one for membership
Type of indicator	Output
Calculation type	Non-cumulative
New indicator	No
Reporting cycle	Annual
Desired performance	Maintained memberships of CCs and CIPM
Indicator responsibility	Technical divisions
INDICATOR KPI 5: MAINTAIN THE QUALITY SYSTEM	
Short definition	Maintain the TQMS at an internationally acceptable level (peer-reviewed quality system)
Purpose/Importance	Quality assurance requirement for the NMISA
Source/Collection of data	Confirmation of continued accreditation; or peer-review reports or schedule of accreditation
Method of calculation	Simple count
Baseline	Percentage laboratories accredited to ISO/IEC 17025:2005 or ISO Guide 34 or related standard; peer-reviewed; maintained as per SANAS schedule of accreditation (unit of measurement changed to number in 2015/16)
Target and target date for the indicator (31 March 2016)	Maintain the SANAS schedule of accreditation and self-declared (peer-reviewed) quality system; quarterly reporting on assessments as per 18 month cycle.
Data limitation	Total Quality Management System not updated
Quality Assurance Strategy	Total Quality Management System and a maintained SANAS schedule of accreditation
Type of indicator	Output
Calculation type	Non-cumulative
New indicator	Yes
Reporting cycle	Quarterly
Desired performance	Maintained Total Quality Management System and maintained SANAS schedule of accreditation
Indicator responsibility	SHEQ Manager
INDICATOR KPI 6: NUMBER OF CMCs PUBLISHED IN KCDB	
Short definition	A measurement capability claim that has been reviewed and accepted by international peers and then published on an international database
Purpose/Importance	Gives customers confidence that a claimed measurement capability is internationally accepted and internationally proven
Source/Collection of data	Appendix B of the International (BIPM) Key Comparison Database (KCDB), published at www.bipm.org
Method of calculation	Simple count

Indicator Output	National Measurement Units
INDICATOR KPI 6: NUMBER OF CMCs PUBLISHED IN KCDB (continued)	
Baseline	411
Target and target date for the indicator (31 March 2016)	Annual target. Counted as the number of CMCs actually published in the BIPM KCDB
Data limitation	It takes time for international approval to take place, which is sometimes outside the NMISA's control to be specific
Quality Assurance Strategy	Quality assurance is inherent in this KPI, as the values are internationally peer-reviewed and published
Type of indicator	Output
Calculation type	Non-cumulative (annual number)
New indicator	No
Reporting cycle	Annual
Desired performance	Capabilities that meet local and international requirements
Indicator responsibility	Technical divisions
INDICATOR KPI 7: PERCENTAGE OF RECAPITALISATION PROJECT COMPLETED	
Short definition	A newly designed the NMISA with appropriate infrastructure to serve the measurement needs of South Africa
Purpose/Importance	Recapitalise and modernise the NMISA to ensure that the national measurement standards support international trade, health, environmental and safety requirements
Source/Collection of data	Financial statements
Method of calculation	Calculate the percentage budget spent on the PPP Project (amount spent/total recapitalisation budget)
Baseline	50% of budget spent
Target and target date for the indicator (31 March 2016)	70% of budget spent (phased budget)
Data limitation	Procurement process; completing and verifying Terms of Reference
Quality Assurance Strategy	Internal audit
Type of indicator	Progress
Calculation type	Cumulative
New indicator	Yes
Reporting cycle	Annual
Desired performance	A new facility for the NMISA
Indicator responsibility	CFO
INDICATOR KPI 8: CONTRIBUTION TO INFRASTRUCTURE INSTITUTIONS	
Short definition	Participate in, and contribute to national technical infrastructure institutions, e.g., SANS and ISO committees, NRCS regulatory bodies and SANAS STCs
Purpose/Importance	Provide technical measurement expertise and support for public policy objectives, accreditation, standardisation and regulatory affairs
Source/Collection of data	Proof of membership of national TI committees (e.g. letter proving the NMISA's membership)
Method of calculation	Simple count
Baseline	34
Target and target date for the indicator (31 March 2016)	44
Data limitation	No meetings or discontinuation of committee
Quality Assurance Strategy	Membership and minutes (of meetings held). Not every committee meets annually
Type of indicator	Output
Calculation type	Non-cumulative

Indicator Output	National Measurement Units			
INDICATOR KPI 8: CONTRIBUTION TO INFRASTRUCTURE INSTITUTIONS (continued)				
New indicator	No			
Reporting cycle	Annual			
Desired performance	Maintained memberships of TI committees			
Indicator responsibility	Technical divisions			
INDICATOR KPI 9: DEMONSTRATED COMPETENCE AND EXCELLENCE IN MEASUREMENT THROUGH SCIENCE OUTPUTS				
Short definition	Number of refereed and/or peer-reviewed papers, manuscripts, articles, application or technical notes, book chapters, etc., accepted for publication in peer-reviewed journals, books or appropriate media		Number of presentations given at conferences, workshops and TAFs on the maintenance, improvement and development of units, metrology methodology measurements and measurement standards and applicable scientific research	
Purpose/Importance	Proof of the scientific competence, excellence and standing of the NMISA, as well as effective and relevant application of research funding towards the maintenance, equivalence, improvement or development of new measurement units and standards			
Source/Collection of data	Number of refereed and/or peer-reviewed papers, manuscripts, articles, application or technical notes, book chapters published.		Acceptance of abstract and/or, conference/work programme or proceedings or Technical Advisory Forum (TAF)) or presentation presented	
Method of calculation	Count the number of publications as either the actual published paper or an official letter from the publisher, stating acceptance of the paper for publication (take care not to count both)		Count the number of number of orals or posters presented and check against accepted abstract and/ or the listings in the conference/ work programme or proceedings or TAF , check presentation in workshop programme, etc.	
Baseline	20 peer-reviewed publications		41 orals/posters presented at conferences/ workshop/ TAF	
Target and target date for the indicator (31 March 2016)	21 peer-reviewed publications		42 orals/ posters presented at conferences/workshops/ TAF	
Data limitation	Delays in projects regarding outputs, financial constraints pertaining to the attendance of conferences, identification of IP, which prohibits publication, long review timelines of some journals, slow response for conference proceeding publications			
Quality Assurance Strategy	These outputs are a peer-reviewed process that ensures quality.			
Type of indicator	Output			
Calculation type	Cumulative			
New indicator	No			
Reporting cycle	Quarterly			
Desired performance	Increase the number or publications and investigate opportunities for students and staff to attend national conferences to encourage research outputs			
Indicator responsibility	Director RTD in conjunction with technical divisions			
INDICATOR KPI 10: SKILLED, COMPETENT AND TRANSFORMED THE NMISA STAFF				
Short definition	Number of postgraduate and undergraduate bursars	Training expenditure as a % of personnel costs	Interns and in-service trainees hosted	Percentage of filled, funded vacancies.
Purpose/Importance	Enhance the qualification profile to build a modern NMI with a strong research and development component			
Source/Collection of data	Certificates, financial statements, employment contracts, Board approved organisational structure and approved budget			
Method of calculation	Simple count, (training expenditure/ personnel cost), simple count, (total number of funded vacant positions filled/ total number of funded positions on the approved organisational structure			
Baseline	10	2%	7	10%
Target and target date for the indicator (31 March 2016)	10	2%	8	9% (tolerance level)

Indicator Output	National Measurement Units			
INDICATOR KPI 10: SKILLED, COMPETENT AND TRANSFORMED THE NMISA STAFF (continued)				
Data limitation	Unexpected decline of bursary offer or cancellation of bursary contract	Staff not undertaking graduate studies and developmental interventions as per their PDP	Intern receiving job offer elsewhere before completion of training	Shortage of appropriate graduates in SA
Quality Assurance Strategy	Academic record or research outputs of candidate			
Type of indicator	Equity			
Calculation type	Cumulative	Non-cumulative		
New indicator	No	No	No	No
Reporting cycle	Annual	Annual	Annual	Annual
Desired performance	Bursaries offered, increase in the pipeline of graduates	Well trained the NMISA staff members and interns who can be placed in the NMISA or other organisations		All funded vacancies filled.
Indicator responsibility	Human Resources			
INDICATOR KPI 11: DISSEMINATION OF NMS AND MEASUREMENT CAPABILITIES				
Short definition	Income generated via calibration, services (PTS and reference measurements), sales (CRMs), consultation, research funds and donor projects (REVENUE).			
Purpose/Importance	To provide measurement traceability to industry via calibration, measurement services, analyss, consultation, research grants and donor projects			
Source/Collection of data	A report of income is downloadable from the NMISA financial system and provided by Finances			
Method of calculation	Simple count			
Baseline	R 8 667K (stretched target reduced to fall within real revenue capability; the NMISA cannot compete with industry for revenue).			
Target and target date for the indicator (31 March 2016)	R9 534K			
Data limitation	Industry not sending units for calibration or analysis; downtime due to building infrastructure and equipment failure or regulatory processes, such as the national acceptance of evidential breath alcohol results; the revenue received is not within the NMISA's control			
Quality Assurance Strategy	Calibration performed under accreditation to ISO 17025 and certificates are signed off by technical staff declared competent as signatories under ISO 17025			
Type of indicator	Output			
Calculation type	Cumulative			
New indicator	No			
Reporting cycle	Quarterly			
Desired performance	Meet and exceed annual financial revenue target			
Indicator responsibility	CFO			
INDICATOR KPI 12: EXTERNAL CLIENT SATISFACTION				
Short definition	Percentage of customer complaints against all jobs			
Purpose/Importance	To provide industry with a sense of ownership and confidence in the NMISA measurements			
Source/Collection of data	Report on the review of customer complaints taken from the Quality System (Customer Action Requests (CARs)			
Method of calculation	Number of customer complaints/ total jobs per quarter			
Baseline	≤ 5%			
Target and target date for the indicator (31 March 2016)	≤ 5%			
Data limitation	Client complaints not raised as CARs in the Quality System and complaints not adequately addressed			

Indicator Output	National Measurement Units	
INDICATOR KPI 12: EXTERNAL CLIENT SATISFACTION (continued)		
Quality Assurance Strategy	Quality System	
Type of indicator	Output	
Calculation type	Non-cumulative	
New indicator	Yes	
Reporting cycle	Quarterly	
Desired performance	Zero customer complaints is ideal; any customer complaints received to be timeously addressed and cleared to the client's satisfaction	
Indicator responsibility	SHEQ Manager	
INDICATOR KPI 13: SKILLED AND CAPABLE LABOUR FORCE FOR MEASUREMENTS IN INDUSTRY		
Short definition	To develop the skills and competencies required to provide essential measurement support to industry	
Purpose/importance	To ensure skills transfer to industry and assist SMEs to meet compliance	
Source/Collection of data	The NMISA Certificate of Training or an official report or an official signed attendance list	Official signed attendance list of participants attending the course presented (course material must be available as evidence)
Method of calculation	Simple count (people)	Simple count (courses)
Baseline	55 metrologists/scientists trained	13 courses presented
Target and target date for the indicator (31 March 2016)	58 metrologists/scientists trained	14 courses presented
Data limitation	Decision to train SMEs is not only under the NMISA 's control; Courses are presented in partnership with other institutions, such as SEDA and NLA	
Quality Assurance Strategy	Signed MoU with SEDA, detailing work plan and schedule for training; Collaboration with NLA for presenting courses using the NMISA experts	
Type of indicator	Output	
Calculation type	Cumulative	
New indicator	No	
Reporting cycle	Quarterly	
Desired performance	Increased number of metrologists and SMEs trained in industry	
Indicator responsibility	Director RTD in conjunction with Technical Directors	
INDICATOR KPI 14: FINANCIALS TO ENSURE COMPLIANCE WITH REGULATORY FRAMEWORKS		
Short definition	Percentage of revenue received expensed	Percentage of total budget spent on CAPEX
Purpose/Importance	Established systems and processes to ensure compliance with regulatory frameworks (PFMA)	
Source/Collection of data	Statement of financial performance and external audit opinion	
Method of calculation	Actual spending of grant funding received	Actual CAPEX spent/ Actual CAPEX allocation
Baseline	98%	20%
Target and target date for the indicator (31 March 2016)	98%	20%
Data limitation	Inadequate financial systems and inadequate controls for ensuring compliance with regulatory frameworks	
Quality Assurance Strategy	Internal Audit	
Calculation type	Cumulative	
New indicator	No	
Reporting cycle	Quarterly	
Desired performance	Full compliance with regulatory frameworks and unqualified audit report	
Indicator responsibility	CFO	

Indicator Output	National Measurement Units
INDICATOR KPI 15:ASSURANCE ON THE ADEQUACY OF INTERNAL AUDIT CONTROLS	
Indicator title (Output)	100% completion of approved Annual Audit Plan and follow-up audits; issuance of audit reports
Short definition	Reasonable assurance on the adequacy, effectiveness, efficiency of internal controls, risk management and governance maters
Purpose/importance	To provide guidance on Internal Audit Activities and focus area based on Organisational Risk Exposure. Management tool to determine the effectiveness of Internal Audit. Forms the bases for progress quarterly reporting to the Audit and Risk Committee
Source/collection of data	Final signed off audit reports
Method of calculation	Number of signed off audit reports/ totals audits planned as per approved audit plan
Baseline	10 (unit of measurement changed from number to percentage)
Target and target date for the indicator (31 March 2016)	100%
Data limitation	Inadequate audit systems and controls for ensuring compliance with regulatory frameworks
Quality assurance strategy	Audit Plan is approved by Audit and Risk sub-Committee before implementation for the financial year
Type of indicator	Internal compliance to regulatory frameworks - quantitative
Calculation type	Cumulative
New indicator	No
Reporting cycle	Quarterly
Desired performance	Full compliance with regulatory frameworks and unqualified audit report and 100% completion of planned and approved audits
Indicator responsibility	Internal Audit

21. ANNEXURE B: RISK REGISTER

Risk Identification											Residual Risk Rating			Control Improvement Plans		
Strategic Objective No.	The NMISA Strategic Objectives	Risk No.	Risk Description	Root Cause	Possible Consequences/ Impact	Inherent Impact (1-5)	Inherent Likelihood (1-5)	Inherent Risk Rating	Existing Controls	Control Adequacy Rating	Control Adequacy Rating (Value)	Residual Risk Rating	Risk Acceptability	Control Improvement Plans	Specific & Realistic Due Date	Risk Owner(s)
1	Provide for the national measurement units by maintaining the SI units, units outside the SI and equivalents of units	1	Inadequate access / contact with international metrology bodies (BIPM, CIPM)	Inadequate participation, due to lack of skilled staff	Inability to support industries and non-achievement of the NMISA mandate. the NMISA will become irrelevant. SA not linking to international practices. Inability to achieve SA obligations under the Metre Convention	5	1	5	Continuous active participation at international level. BIPM, CIPM	Adequate	80%	1	Acceptable	Continued active participation at international level and conduct a transfer of knowledge to inexperienced staff. Implement a knowledge management system	Ongoing	CEO/ CFO and Technical Directors
2	Maintain the Schedule of National Measurement Standards	2	Inadequate the NMISA infrastructure to support global fast-pace technological advancement fit-for-purpose to SA measurement needs. International comparability. Interrupted power supply.	Rapid technological advance-ments. High demand for improved measure-ment standards by industry. Poor maintenance	Inability to support industries and non-achievement of the NMISA mandate. the NMISA will become irrelevant.	4	5	20	Continuous monitoring and maintenance of the old infrastructure.	Inadequate	20%	16	Unacceptable	Develop and implement an Asset Renewal / Replacement Strategy and Plan. The NMISA Recapitalisation Project initialised. Increased CAPEX budget allocation for specialised recapitalisation of infrastructure. Feasibility study initiated to draw up recommendations to be considered.	30 September 2015	CEO/ CFO and Technical Directors
3	To maintain the calibration and measurement capability (CMC) claims in KCDB as evidence of South Africa's measurement capability															CEO/ CFO and Tech-nical Directors

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Risk Identification											Residual Risk Rating			Control Improvement Plans		
Strategic Objective No.	The NMISA Strategic Objectives	Risk No.	Risk Description	Root Cause	Possible Consequences/ Impact	Inherent Impact (1-5)	Inherent Likelihood (1-5)	Inherent Risk Rating	Existing Controls	Control Adequacy Rating	Control Adequacy Rating (Value)	Residual Risk Rating	Risk Acceptability	Control Improvement Plans	Specific & Realistic Due Date	Risk Owner(s)
4	Recapitalise and modernise the NMISA to ensure that the national measurement standards support international trade, health, environmental and safety requirements	2	Inadequate the NMISA infrastructure to support global fast-pace technological advancement fit-for-purpose to SA measurement needs. International comparability. Interrupted power supply.	Rapid technological advance-ments. High demand for improved measure-ment standards by industry. Poor maintenance	Inability to support industries and non-achievement of the NMISA mandate. the NMISA will become irrelevant.	4	5	20	Continuous monitoring and maintenance of the old infrastructure.	Inadequate	20%	16	Unacceptable	Develop and implement an Asset Renewal / Replacement Strategy and Plan. The NMISA Recapitalisation Project initialised. Increased CAPEX budget allocation for specialised recapitalisation of infrastructure. Feasibility study initiated to draw up recommendations to be considered.	30 September 2015	EO/ CFO and Technical Directors
5	Disseminate traceability, measurement expertise and services to South African public and private enterprises by means of calibration, measurement or analysis, certified reference materials															CEO/ CFO and Technical Directors
6	Keep, maintain and develop measurement systems for bringing national measurement standards and reference methods into being	3	Ineffective and inefficient 'Heating Ventilation and Air-conditioning (HVAC) System that does not support environmental conditions in the laboratory	Outdated and inappropriate Heating Ventilation and Air-conditioning System. Inadequate HVAC design. Aged HVAC	Inability to support industries and non-achievement of the NMISA mandate. the NMISA will become irrelevant.	5	5	25	Continuous monitoring and maintenance of the old infrastructure.	Inadequate	20%	20	Unacceptable	Procurement of Chiller is currently in progress. An assessment of HVAC conducted to draw up recommendations for replacement. Recapitalisation process / feasibility study also in progress to inform long-term solution.	30 September 2015	CEO/ CFO and Technical Directors

Risk Identification										Residual Risk Rating			Control Improvement Plans		
Strategic Objective No.	The NMISA Strategic Objectives	Risk No.	Risk Description	Root Cause	Possible Consequences/ Impact	Inherent Impact (1-5)	Inherent Likelihood (1-5)	Inherent Risk Rating	Existing Controls	Control Adequacy Rating	Control Adequacy Rating (Value)	Residual Risk Rating	Risk Acceptability	Control Improvement Plans	Specific & Realistic Due Date	Risk Owner(s)
7	To ensure internationally recognised and comparable national measurement standards and units by participating in the Metre Convention, CIPM MRA and AFRIMETS activities	4	Lack of adequately competent, skilled staff.	Poor planning. Lack of integrated HR Development Plan. Inadequate knowledge transfer and management process. Ineffective monitoring of Personal Development Plans.	Inability to conduct R&D. Suspension of activities due to lack of expertise. The NMISA will become irrelevant. Inability to participate in international comparisons	5	5	25	Created a pipeline via bursary programmes and internships. Exchange programmes for post- graduate studies. Internships at other NMIs	Inadequate	20%	20	Unacceptable	Develop and implement an integrated HR Development Strategy and Plan. (Recruitment, Retention and Succession) knowledge transfer and management process. Implement exchange programmes with other NMIs	30 June 2015	CEO / CFO and Technical Directors
8	Establish confidence in the accuracy of the national measurement standards via a suitable and documented quality and management system			Inadequate training / transfer of technical skills	Loss of client confidence and credibility											
9	As the foundation of the South African measurement system, provide technical measurement expertise and support for public policy objectives, accreditation, standardisation and regulatory affairs	5	Lack of alignment between asset renewal / replacement strategy and Integrated Human Capital Development Strategy and Plan	Training and development not aligned to new technological changes. Technical training based on old and obsolete equipment, due to the lack of an asset renewal strategy	Loss of credibility and international standing due to imported traceability to support industry. The NMISA becoming irrelevant. Reduced funding. Untransformed organisation and workforce. Financial loss due to unsustainable operations and lack of continuity	5	4	20	Training to enhance the managerial skills of section heads. Monitored and documented probation periods. New employees training plans(files). Staff development plans. MoU with other NMIs and universities	Partially adequate	50%	10	Cautionary	Improved recruitment processes, attract quality scientists, specialising in measurement. Improved training in measurement technology, e.g. studies and internship at other NMIs Developing project proposals for cross-cutter research projects. Link Asset Renewal Strategy to HCD Strategy and Plan	30 June 2015	CEO/ CFO and Technical Directors

Strategic Objective No.	The NMISA Strategic Objectives	Risk No.	Risk Description	Root Cause	Possible Consequences/ Impact	Inherent Impact (1-5)	Inherent Likelihood (1-5)	Inherent Risk Rating	Existing Controls	Control Adequacy Rating	Control Adequacy Rating (Value)	Residual Risk Rating	Risk Acceptability	Control Improvement Plans	Specific & Realistic Due Date	Risk Owner(s)
10	To maintain and ensure continued expertise and establish the necessary skills in accordance with internationally acceptable standards	5	Lack of alignment between asset renewal / replacement strategy and Integrated Human Capital Development Strategy and Plan	Training and development not aligned to new technological changes. Technical training based on old and obsolete equipment, due to the lack of an asset renewal strategy	Loss of credibility and international standing due to imported traceability to support industry. The NMISA becoming irrelevant. Reduced funding. Untransformed organisation and workforce. Financial loss due to unsustainable operations and lack of continuity	5	4	20	Training to enhance the managerial skills of section heads. Monitored and documented probation periods. New employees training plans(files). Staff development plans. MoU with other NMIs and universities	Partially adequate	50%	10	Cautionary	Improved recruitment processes, attract quality scientists, specialising in measurement. Improved training in measurement technology, e.g. studies and internship at other NMIs Developing project proposals for cross-cutter research projects. Link Asset Renewal Strategy to HCD Strategy and Plan	30 June 2015	CEO/ CFO and Technical Directors
11	Provide appropriate technology and skills transfer to the South African industry, especially to SMEs															
12	Comply with government directives, the PFMA, Treasury Regulations and regulatory issues in terms of health, safety and the environment, and apply good governance	6	Non-compliance to PFMA, PPPFA, GRAP, other applicable legislation.	Failure to keep up-to-date with legislation, resulting in inadequate policies and procedures. Inadequate awareness and training. Ineffective implementation of policies and procedures.	Modified audit opinion. Financial losses due to non-compliance, reduced funding. Reputational damage. Loss of accreditation Loss of CMCs in international database.	4	2	8	Established Compliance Office, Internal Audit and Quality and EHS functions to review compliance with all applicable legislation. Continuous review of policies and procedures.	Adequate	80%	2	Acceptable	Continuous compliance reviews by Compliance Office, Internal Audit and Quality and EHS functions. Continuous review of policies and procedures.	ongoing	Manager Internal Audit, Manager Compliance and Corporate Governance, Manager Quality and EHS

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