

# **sansa**

# **ANNUAL REPORT**

## **2015/16**



# GENERAL INFORMATION

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<b>Bankers:</b>	ABSA Bank
<b>Board secretary:</b>	Ms Lorraine Harrison

# ACRONYMS

AGU	American Geophysical Union
AIT	Assembly, Integration and Testing
ALC	African Leadership Conference
ARMC	African Resource Management Constellation
ASAL	Algerian Space Agency
ATNS	Air Traffic Navigation Services
AU	African Union
AUSWG	African Union Space Working Group
BAS	British Antarctic Survey
BDMS	Botswana Department of Meteorological Service
CAA	Civil Aviation Authority
CBERS 4	China/Brazil Earth Resources Satellite
CEOS	Committee on Earth Observation Satellites
CIPS	Chartered Institute of Procurement and Supply
CNES	Centre National d'Etudes Spatiales, French Space Agency
CNSL	China National Space Administration
CoS	Conditions of Service
CPRR	Competitive Programme for Rated Researchers
CPUT	Cape Peninsula University of Technology
CSC	Climate Service Centre, SADC
CSD	Central Supplier Database
CSIR	Council for Scientific and Industrial Research
DemoGRAPE	Demonstrator of GNSS Research and Application for Polar Environment
DF	Direction Finding

DIFR	Disabling Injury Frequency Rate
DIRISA	Data Intensive Research Initiative for South Africa
DLR	German Space Agency
DRC	Democratic Republic of the Congo
DRS	Direct Receiving Station
DST	Department of Science and Technology
DoD	Department of Defence
DWS	Department of Water and Sanitation
EA	Enumerator Areas
EDRS	European Data Relay Satellite
EIA	Environmental Impact Assessment
EISCAT	European Incoherent Scatter Radar
EO	Earth Observation
ERM	Enterprise Risk Management
ERP	Enterprise Resource Planning
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FOC	Full Operational Capability
FDP	Fundisa Disk Programme
FPI	Fabry-Perot Interferometer
GEO	Group on Earth Observation
GICs	Geomagnetically Induced Currents
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HARTRAO	Hartebeesthoek Radio Astronomy Observatory
HC	Human Capital
HEI	Higher Education Institute

HF	High-Frequency
HPC	High Performance Computing
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
IMT	Institute for Maritime Technology
INGV	Istituto Nazionale di Geofisica e Vulcanologia
INPE	Instituto Nacional de Pesquisa Espaciais
IPS	Interconnected Power System
IPSP	International Partnerships in Space Programme
IRI	International Reference Ionosphere
ISES	International Space Environment Service
ISRO	Indian Space Research Organisation
IUGG	International Union of Geodesy and Geophysics
KIC	Knowledge, Interchange and Collaboration
KSAT	Kongsberg Satellite Services
LCP	Left-hand Polarisation
LEOP	Launch and Early-orbit Phase
LWS	Living with a Star
MDTP	Management Development and Training Programme
MESA	Monitoring for Environment and Security in Africa
MISR	Multi-Angle Imaging Spectro-Radiometer
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
MT	Magnetotellurometer
MTSF	Medium-Term Strategic Framework
NASSP	National Astrophysics and Space Science Programme

NDP	National Development Plan
NEMA	National Environmental Management Act
NEP	National Equipment Programme
NOAA	National Oceanic and Atmospheric Administration
NRCan	Natural Resource Canada
NRF	National Research Foundation
NPA	National Ports Authority
NSP	National Space Programme
NUST	Namibian University of Science and Technology
OSL	Optical Space Laboratory
OSR	Optical Space Research
PDP	Professional Development Programme
PFMA	Public Finance Management Act
QZSS	Quasi-Zenith Satellites System
R&D	Research and Development
RCP	Right-hand Polarisation
RTCA	Radio Technical Commission for Aeronautics
SAAF	South African Air Force
SAAO	South African Astronomical Observatory
SAASTA	South African Agency for Science and Technology Advancement
SADC	Southern African Development Community
SAEOS	South African Earth Observation Strategy
SAMSA	South African Maritime Safety Authority
SANAP	South African National Antarctic Programme
SANDF	South African National Defence Force
SANDIMS	South African National Geophysical Data and Instrumentation Management System

SANAE	South African National Antarctic Expeditions
SANSA	South African National Space Agency
SARL	Secunda Amateur Radio Club
SAWS	South African Weather Services
SBAS	Satellite-Based Augmentation System
SDI	Scanning Doppler Imager
SEP	Space Engineering Programme
SHEQ	Safety, Health, Environment and Quality
SLA	Service Level Agreement
SLIM	Single Layer Model
SLUMA	Spatial Planning and Land Use Management Act, 16 of 2013
SO	Space Operations
SOC	Scientific Oversight Committee
SS	Space Science
STEM	Science, Technology, Engineering and Mathematics
TIDS	Travelling Ionospheric Disturbances
TIGER	ESA "Looking for water in Africa" TIGER initiative
TOSS	Transfer-orbit Support Services
TT&C	Telemetry, Tracking and Command
UAV	Unmanned Aerial Vehicle
UCL	University College London
UCT	University of Cape Town
UWC	University of the Western Cape
VO	Variation Order
WiPiSA	Women in Physics in South Africa
ZDS	Zodiac Data System

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**Mrs Naledi Pandor,  
Minister of Science and Technology**

## MINISTER'S STATEMENT

In South Africa, we demand a level of service delivery and respect for human rights from our leaders and government. We expect uninterrupted electricity supply, clean water, enough food to feed our families, a safe and secure country and employment to address the challenges facing so many of our people. These are a few of the important areas where an investment in space can be of benefit to the country and its citizens.

I have been fortunate to have experienced, as Minister of Science and Technology, the impact science and technology has for every citizen. It makes me proud that, even with a budget incomparable to those of other space-faring nations, our space agency has positioned South Africa as a valuable space science research, innovation and product development agency on the continent.

SANSA has now been operational for five years and notwithstanding the establishment challenges that faces any new entity, we have seen many successes emerging from this growing enterprise. The Agency delivers high quality, processed satellite data from numerous Earth observation satellites for use by various government departments to support decision-making and budgeting towards service delivery targets. This contributes significantly towards addressing the needs of our citizens. The knowledge and tools are addressing the need to simplify and speed up delivery from government, which saves public money and time.

I have always stressed the importance of using science and technology to improve the lives of our people and the state of our economy and I am satisfied that through investment in space science we are moving towards achieving the desired knowledge-economy in South Africa while attending to the needs of our citizens.

The impact of the space agency lies not only in its high-tech data and applications but also in its contribution to global space science knowledge through scientific research and development, either independently or collaboratively with other countries. SANSA also continues to cement South Africa's role as a participant in the global space arena through an impressive track record of successfully supporting international space missions.

There has been steady progress with the construction of South Africa's next Earth observation satellite, EO-Sat1, as well as efforts to develop a local space industry. While I have stated the need to improve funding for science and technology in South Africa, I remain confident that we will be innovative in how we use science to find solutions to society's problems.

I express my appreciation to the SANSA Board, outgoing CEO, his management and staff for their tenacity and perseverance in contributing to output from space science and technology for the country and delivering against the Department of Science and Technology's strategic focus area of space.



**Mrs Naledi Pandor**  
**Minister of Science and Technology**





**Ms Joy-Marie Lawrence, Chairman**

## FOREWORD BY THE CHAIRMAN

Space science in South Africa is exciting, whether as an investment or career choice, or because it is an endeavour from which we all benefit.

If I were asked about what will drive future economies, I would suggest the products, services and opportunities derived from space science and technologies. Recent economic and technological advances, such as transforming our world into a global 'village' through global connectivity, have contributed significantly to how we live on planet Earth and made our universe more accessible.

Despite political and economic differences, we continue to work with partners across borders and continents. Who knows, perhaps in the not too distant future, man could relocate to distant planets through such partnerships!

At SANSA, however, the goals are closer to home with the desire to ensure that every South African Rand we spend has some impact on the lives of our citizens. I am privileged to have spent another year as Chairman of the SANSA Board and seen the Agency complete its fifth operating year successfully. Under the Board's direction and oversight, the growing maturity of the Agency's policies, processes, systems and governance have confirmed its accountability in the service of humanity.

The management and staff of SANSA continue to display a passion for excellence in delivering against their strategic goals and my confidence in a bright future for South Africa's young space agency remains unwavering.

SANSA achieved a high standard of delivery across all key performance targets in its 2015/16 Annual Performance Plan. This affirms the Board's belief that despite tough economic challenges locally and abroad, the desire to fulfil the Agency's mandate remains a priority for the Department of Science and Technology and SANSA employees.

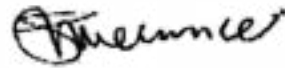
A review of SANSA's performance against strategic objectives during the past financial year further convinces me that the Agency has again succeeded in driving scientific enquiry and knowledge creation, as well as technology development and innovation. The activities of the Corporate Support, Space Science, Space Operations, Earth Observation and Space Engineering programmes continued to position the country as an active and valued participant in the community of space-faring nations by providing stakeholders with useful and impactful products, services, applications and knowledge. I am confident that, going forward, the implementation of the new forward-looking strategy for SANSA will mirror the same high standard as during the past five years of operations.

Strong leadership and a dedication to fulfilling its mandate has ensured that SANSA's space programmes supported South Africa's National Development Plan by contributing to global knowledge, playing a significant role in international deep space missions and providing our government departments with the best satellite data, products and applications to improve service delivery.

I wish to thank the Minister of Science and Technology, my fellow Board members and SANSA's management, staff and stakeholders for their continued support of the

Board in its oversight role over the nation's space agency. A special note of recognition goes to the outgoing CEO, Dr Sandile Malinga, who has been at the helm of SANSA since its inception in 2010. His leadership and passion spearheaded a number of significant achievements and won numerous accolades for SANSA, all of which have made a meaningful contribution to our country's economic and societal well-being. The Board and I wish him success in his new venture and look forward to welcoming his successor.

On behalf of the Board, I also convey our sincere appreciation to all employees at SANSA for their unstinting contribution towards achieving the Agency's goals and improving the lives of the people of South Africa.



**Ms Joy-Marie Lawrence**  
**Chairman / Accounting Authority**



**Dr Sandile Malinga, CEO**

## CHIEF EXECUTIVE OFFICER'S OVERVIEW

As I reflected on SANSA's activities during the 2015/16 financial year, I was again struck by the impact of our activities in space science and technology on the citizens of our country. The passion and expertise of the SANSA team continues to inspire me every time I speak at a conference or event, as does the very real public interest in and support for our research and innovations, as well as participation in our outreach activities.

I am especially encouraged by our results for the past financial year, which indicate a significant achievement of the new targets set to achieve the goals of our 2015-2020 strategy. In addition, SANSA continued to contribute to the government's national service delivery goals and the National Development Plan.

### The end of the first phase of establishment

SANSA has successfully completed the significant first five-year phase of its establishment. The journey has been exciting and rewarding, and although challenging at times I believe that we have matured into a space agency on par with our peers internationally. We can go forward with confidence and a firm commitment to our mandate, in service of humanity.

Priorities during the past year included the revision and improvement of existing systems and processes to use our limited resources effectively amidst taxing economic pressures. We also developed policies and

tools for informed decision-making in housing and infrastructure planning to improve service delivery and used space weather technologies to improve navigation, communications and the supply of electricity in the technology-dependant industries.

Our researchers contributed to global scientific knowledge in space and Earth sciences and provided government departments and customers with high-quality satellite data, products and services to achieve national deliverables. These ranged from disaster management, drought monitoring and the provision of good quality housing, all of which have affected the lives of our citizens.

The skills and expertise of our space operations team yet again affirmed South Africa's capability to reliably and efficiently provide launch and in-orbit support services to clients locally and within the global space industry. The successful continuation of many navigation and communications services across the world is due, in part, to the level of service rendered by the SANSA team.

### The future of space science in South Africa

As we continue to meet the goals set by the Department of Science and Technology to ensure that the benefits of space science and technology reach our people, we remain cognisant of the future milestones in the space industry.

Although South Africa, currently, does not prioritise deep space missions or human space exploration, we are committed to contributing to the global knowledge pool about humanity's existence on Earth and we value the involvement of our stakeholders towards meeting our


ambitions in this regard on behalf of the country.

This annual report contains an update on the local satellite development programme, which will provide South Africa with Earth observation data and products and undoubtedly include many other significant achievements by the specialists and support staff at SANSA, who continuously strive for perfection in meeting our strategic goals and objectives.

### Notes of appreciation

As the first and now outgoing CEO of SANSA, I take this opportunity to thank the Minister of Science and Technology and our Board members for guiding and supporting this Agency in its accomplishments and significant achievements, as well as encouraging us to always aim higher. My gratitude also goes to the staff and management for supporting me in fulfilling my role at the helm of SANSA. I wish them well on the 'space' journey that lies ahead.

As I move away from SANSA, I look forward to seeing this passionate young Agency achieve many years of notable results in service of our people, the global space community and humanity as a whole.



**Dr Sandile Malinga**  
**Chief Executive Officer**

# STATEMENT OF RESPONSIBILITY AND CONFIRMATION OF ACCURACY OF THE ANNUAL REPORT

We confirm that, to be best of our knowledge that:

All information and amounts disclosed in this Annual Report is consistent with the Annual Financial Statements audited by the Auditor-General.

The Annual Report is complete, accurate and free from any omissions and has been prepared in accordance with the Annual Report Guidelines issued by National Treasury.

The Annual Financial Statements (Part F) have been prepared in accordance with the South African Standards of Generally Recognised Accounting Practice (GRAP) standards that apply to a public entity.

The Accounting Authority is responsible for the preparation of the Annual Financial Statements and judgements made in this information. The Accounting Authority is also responsible for establishing and implementing a system of internal controls designed to provide reasonable assurance about the integrity and reliability of the performance and human resources information and the Annual Financial Statements.

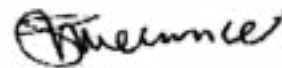
The external auditors are engaged to express an independent opinion about the Annual Financial Statements.

In our opinion, the Annual Report fairly reflects the operations, performance and human resources information and the financial affairs of the public entity for the financial year ended 31 March 2016.

Yours faithfully



**Dr Sandile Malinga**  
**Chief Executive Officer**



**Ms Joy-Marie Lawrence**  
**Chairman**



# REPORT AT A GLANCE

SANSA - In service of humanity

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**Vision, mission and values**

**Organisational structure**

**Business, goals and programmes**

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Key activities and impact

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Programme structure and functional scope

Key activities and impact

**Programme 3**

**SPACE SCIENCE**

Year-to-date highlights

Programme structure and functional scope

Key activities and impact

**Programme 4**

**SPACE OPERATIONS**

Year-to-date highlights

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Key activities and impact

**Programme 5**

**SPACE ENGINEERING**

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Programme structure and functional scope

Key activities and impact

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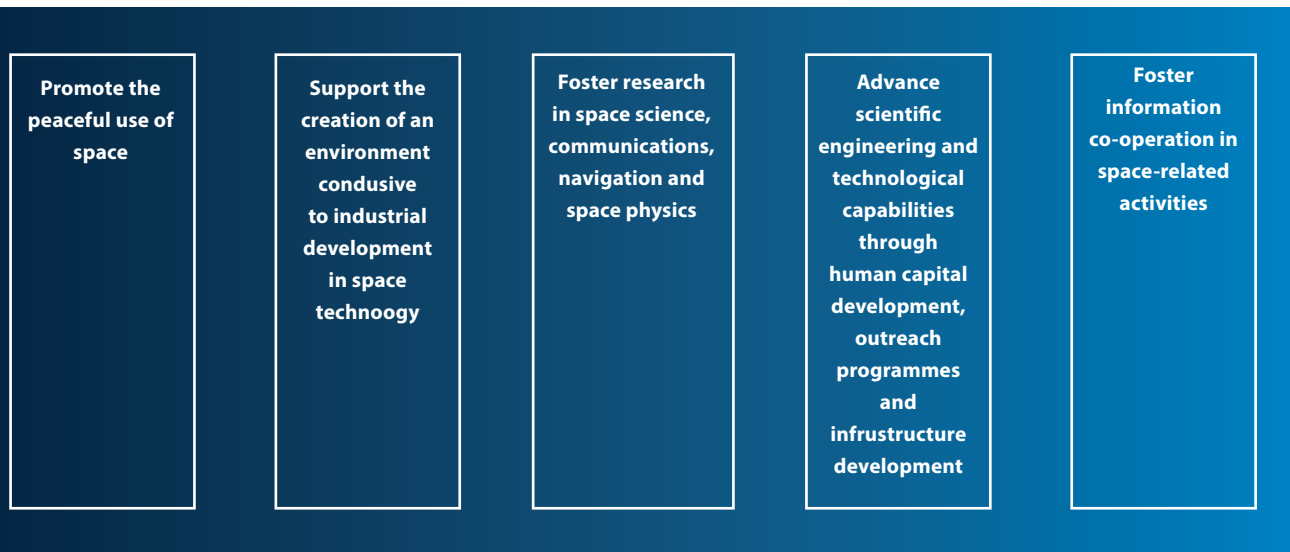
Financial position analysis

# STRATEGIC OVERVIEW



# STRATEGIC OVERVIEW

## Legislated mandate



**Figure 1: SANSA's mandate.**

SANSA derives its strategic mandate primarily from the:

- National Development Plan
- Ten-year Innovation Plan
- National Space Strategy
- South African Earth Observation Strategy.

### National Development Plan (NDP)

SANSA contributes towards the National Development Plan (NDP) through creating jobs; improving geospatial patterns to develop marginalised communities; using space systems to plan and monitor the backbone national infrastructure;

providing health surveillance and intelligence through the use of satellite data; improving service delivery with space-based performance monitoring; and providing geospatial decision-making tools.

### Medium-Term Strategic Framework (MTSF)

The South African government adopted the Medium-Term Strategic Framework (MTSF) to help realise the Vision 2030 of the NDP. The 14 key outcomes, associated activities and targets in the MTSF cover the focus areas in the NDP and are set for achievement by 2019.

# Vision

South Africa to be an international Hub for space solutions, for the world and the future.

# Mission

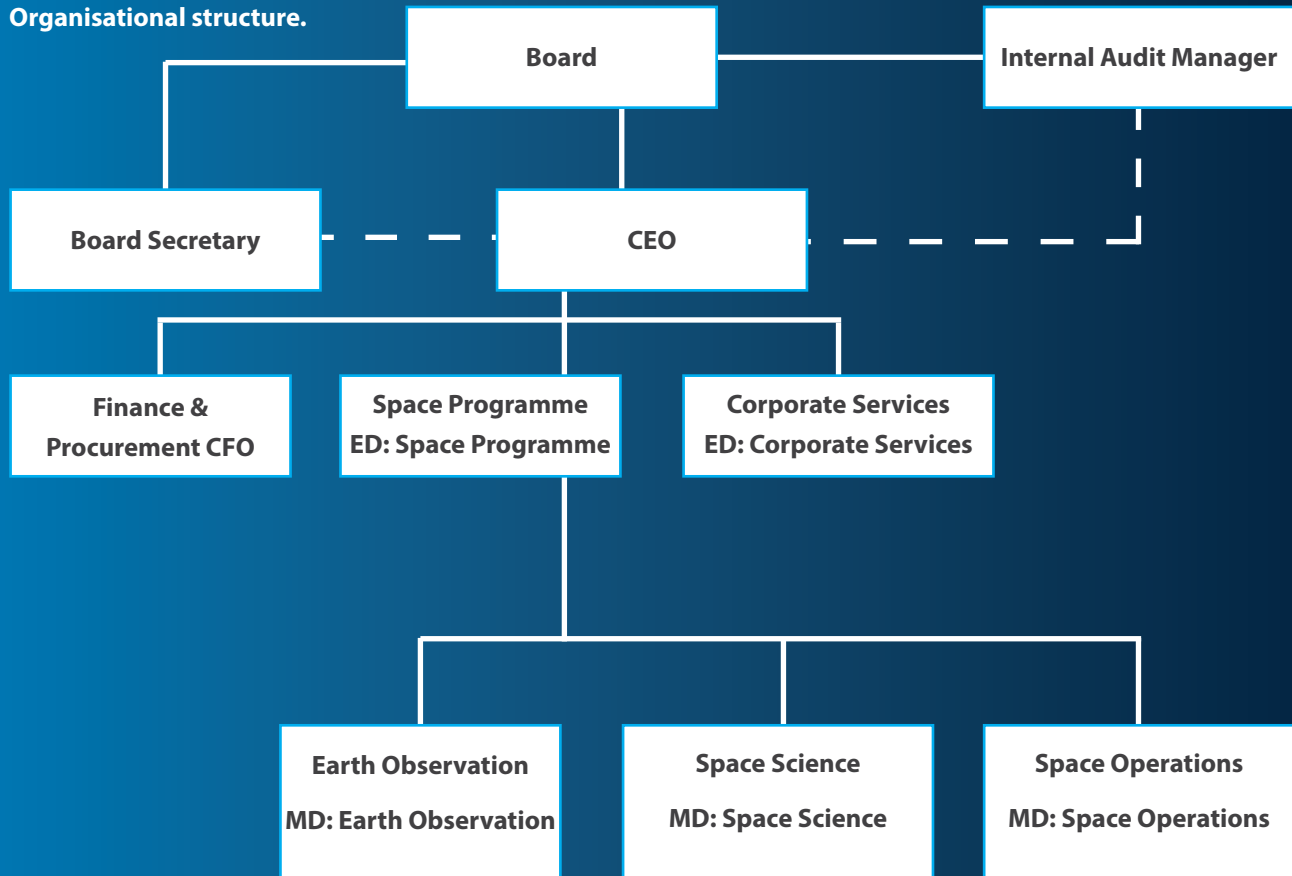
Lead and inspire the South African space community to create a better future.

# Values

Our values are:

- Service
- Teamwork
- Excellence
- Integrity
- Respect
- Personal growth

## Organisational structure.



## Business, goals and programmes

### SANSA Corporate Office

### Corporate Support Programme

SANSA Earth  
Observation  
Directorate

SANSA Space  
Operations  
Directorate

SANSA Space  
Science  
Directorate

#### \* Space Programme

*\* The Space Programme oversees all the space programmes and includes the management of SANSA's space engineering activities.*

Earth  
Observation  
Programme

Space  
Operations  
Programme

Space  
Science  
Programme

**Goal 1: Address South Africa's challenges through space services and products**

**Goal 2: Lead high-impact collaborative R&D on a national scale**

**Goal 3: Develop national human capacity and ensure transformation**

**Goal 4: Enhance the competitiveness of the South African Space Industry**

**Goal 5: Develop active global partnerships**

**Goal 6: Ensure the growth and sustainability of SANSA**

**Goal 7: Transform SANSA into a high-performance Agency**

## STRATEGIC GOAL 1

Address South Africa's challenges through space services and products

Space plays a crucial role in providing government with operational and decision-support tools to address national priorities and challenges in areas such as natural resource management, climate change and environmental management, disaster management, rural development and urban planning, and national safety and security. SANSA's primary objective in this regard is to ensure that space applications are integrated into service delivery as an indispensable tool for government decision-making and policy formulation.

## STRATEGIC GOAL 2

Lead national, high-impact, collaborative R&D

SANSA believes firmly in the value of fundamental and applied science to create new knowledge, technologies and innovation for economic and societal benefit and increase our knowledge and understanding of the universe, its sustainability and ourselves. In this regard, SANSA fosters and leads collaborative, space-related research and development (R&D) on a national scale with the primary objective of increasing our national space research output.

### STRATEGIC GOAL 3

#### Develop national human capacity and ensure transformation

We need to stimulate a wide interest among our youth in science, technology, engineering and mathematics (STEM) to develop the rare and transferable skills we need to deliver against the NSP targets. Capacity development in space-related areas will benefit our space initiatives as well as contribute to other areas that require scientists, engineers and technicians. SANSA adopts a transformation objective in driving human capacity and skills development initiatives.

### STRATEGIC GOAL 4

#### Ensure the competitiveness of the South African space industry

The global space industry, with an estimated nett worth of over \$300 billion, is growing at a rapid rate. New technologies and innovative applications often transcend space systems to find relevance in sectors such as medicine, manufacturing, security and energy. SANSA supports the NSP objective of ensuring that South Africa captures a reasonable share of the global space market.

### STRATEGIC GOAL 5

#### Develop active global partnerships

Space science and technology, by its nature, is part of a global partnership. South Africa, through SANSA, is well-positioned as a strategic space partner for the

African continent, BRICS countries, other continental and regional blocks and global players in space science and technology. The socio-economic value of establishing and maintaining effective and mutually-beneficial international partnerships are aligned with South Africa's strategic priorities and space programme aspirations.

### STRATEGIC GOAL 6

#### Ensure the growth and sustainability of SANSA

SANSA must grow sustainably to remain relevant in the fast-changing global space market and meet the ever-changing socio-economic needs of the country. A strong focus on new business development, effective stakeholder engagement and results-driven communication to promote the NSP are imperatives through which the Agency fulfils its mandate to obtain favourable publicity and increase brand equity. SANSA pursues a number of activities that contribute towards its growth in revenue.

### STRATEGIC GOAL 7

#### Transform SANSA into a high-performance Agency

SANSA drives a number of initiatives to position itself as a high-performance organisation with transformational leadership, effective human capital management, innovative business design and operational and technological effectiveness and efficiency.

# SPACE CONTRIBUTING TO OUR LIVES





### Causes of urbanisation

- Population pressure and inadequate social services in rural areas ('push' factors).
- Improvement of living conditions such as standard of living, well-paid jobs, more opportunities to find 'informal' and formal work, better health care and education ('pull' factors).
- Decrease in death rates while birth rates remain high.

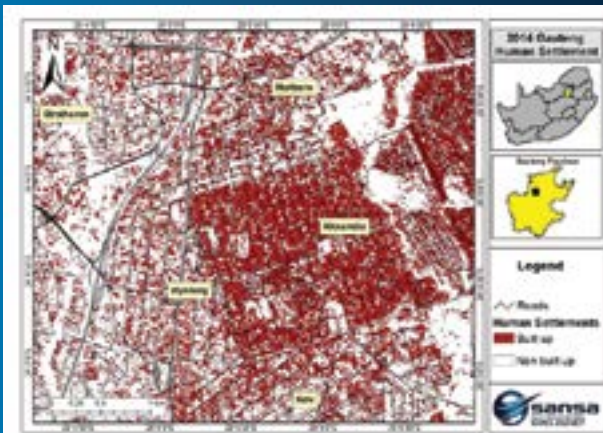
## IMPROVING HUMAN SETTLEMENTS

Almost 60% of the world's population will live in urban areas by 2030. The Department of Human Settlements (DHS) wants to eradicate the country's housing backlog by supplying 2,1 million housing units to about 12,5 million people in a quality environment with access to services. A tract of public land (6 250 ha) has been allocated for an estimated 400 000 low-income and affordable housing units, with plans to deliver at least 20 000 units per year.

### Addressing urban housing challenges

In response to the challenges municipalities face in dealing with the growth of human settlements around cities in South Africa, SANSA, in collaboration with the Joint Research Council (JRC), developed the 2012-2014 Human Settlement Layers for South African Cities. Results show the development of human settlements around selected cities, currently those in Gauteng, as well as Kimberly, Bloemfontein, East London, Cape Town and Rustenburg.

The DHS, through SANSA, used the latest available SPOT-5 imagery in the human settlement tool to automatically detect human settlement data around these cities and other areas of interest. The data assists municipal decision-makers to plan and manage human settlements in urban areas. The tool also supports urban spatial planning and development policies for human settlements, particularly the National Development Plan (NDP) and the Spatial Planning and Land Use Management Act (SLUMA), 16 of 2013.



Human settlement growth in Gauteng in 2014

Almost 1.5 million children (one in four under the age of six years) experience stunted growth due to chronic malnutrition. Food security is on the global policy agenda and many role players are rising to the challenge. Locally, the Government's goal is to provide all South Africans with access to safe and nutritious food. Collaboration in projects such as the University of Stellenbosch's strategic food security initiative, will help us to achieve this.



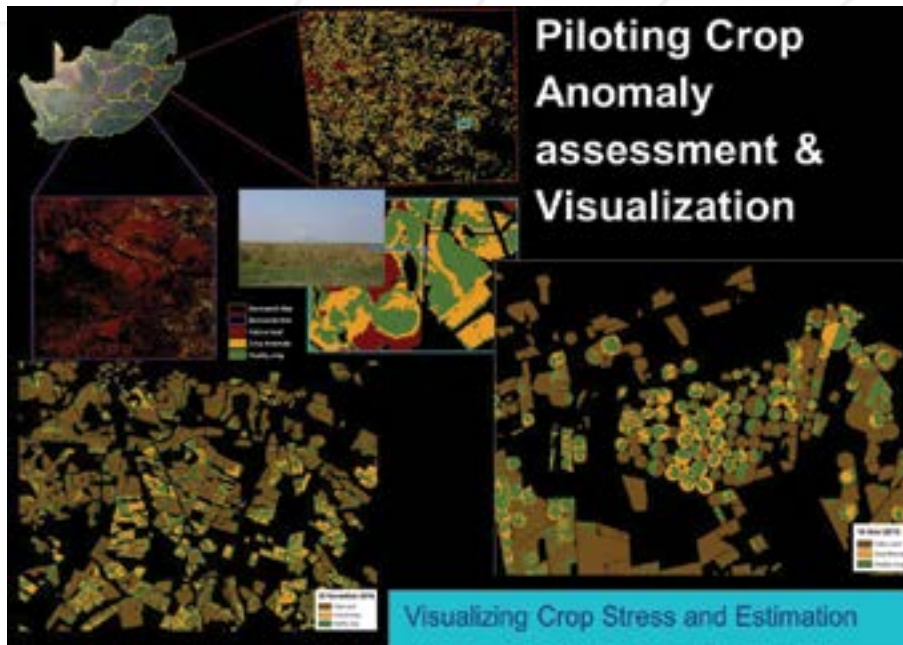
## ENHANCING AGRICULTURE PRODUCTION

South Africa's integrated food security strategy (Department of Agriculture, 2002) identifies inadequate safety nets, weak disaster management, insufficient household food production, lack of purchasing power and poor status as key food security challenges. Crop failures and post-harvest loss (PHL) further exacerbate this reality.

During the past year, SANSA's work under this theme produced essential biophysical variables under the Crop Watch for South Africa (CW4SA) project, funded through the UK Space Agency's International Partnerships in Space Programme (IPSP) with Airbus Defence and Space as collaborator.

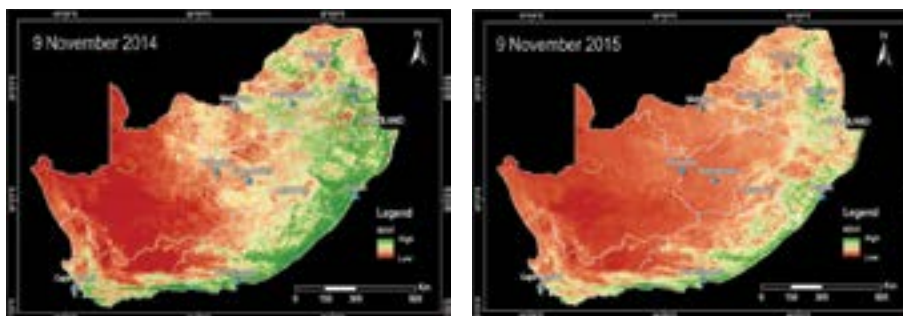
South African farmers and extension services are currently without access to near-real-time information on field and crop conditions. This initial pilot study provided key variables, such as vegetation indices, soil moisture content, land surface temperature, evapotranspiration rates over dry-land cropping and irrigation fields in the Free State province to build a case for a longer-term programme of agricultural and natural resource monitoring and assessment.

These indices are a prerequisite for, identifying crop types, estimating plantation areas, monitoring, forecasting and assessing crop yield and damage or stress.



**Crop stress estimation.**

SANSA also developed the Drought Observatory (SANSA-DO), a vegetation change visualisation tool that shows the temporal and spatial progression of vegetation indices during the 2014/15 growth cycle.



**Maps depicting the change in vegetation over time in South Africa, Lesotho and Swaziland.**

Estimates indicate that the demand for water in South Africa will reach 17.7 billion m<sup>3</sup> by 2030. The current supply stands at 15 billion m<sup>3</sup>. The effects of climate change could exacerbate the problem: even a small decrease in rainfall (and corresponding increase in irrigation demands) could result in a water shortage of 3.8 billion m<sup>3</sup>.



## IMPROVING WATER MANAGEMENT

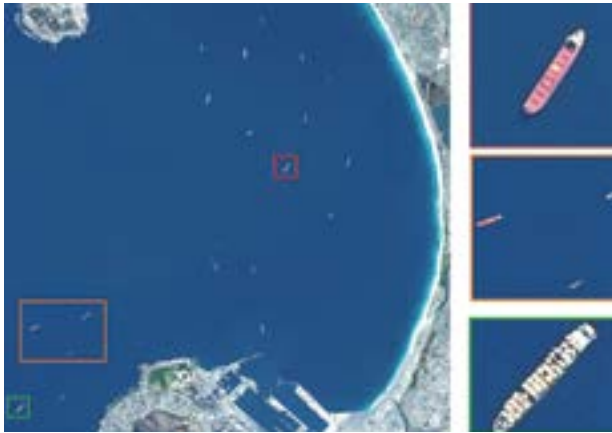
Globally, water resource management is the most significant challenge in this century and beyond. Water challenges in South Africa emanate from a semi-arid climate and low seasonal rainfall, as well as insufficient aquifers, a dependence on water transfer from neighbouring countries ( $\pm$  25% of total supply from Lesotho) and water demands for agriculture, critical industries (mining, power generation) and large and growing urban centres.

SANSA used Landsat data to identify algal concentrations and map the water quality in dams, such as the Vaal and Hartbeestpoort dams. The Single Layer Model (SLIM) unit of the Department of Water and Sanitation (DWS) uses these satellite data, provided by SANSA, to regulate and monitor water use in compliance with National Water Act, 36 of 1998, authorise and license water use for irrigation and assess the status of small water bodies at municipal level. SANSA supplied Rand Water with products to monitor algal bloom in the Vaal Dam and developed critical information on dam levels in the Free State during the severe drought in 2015.

## Support for Operation Phakisa

The government-initiated Operation Phakisa programme aims to unlock economic potential within the ocean environment under South Africa's jurisdiction by reducing illegal activities and promoting socio-economic benefits. SANSA's high-resolution satellite imagery provides synoptic and repetitive monitoring of the oceanic environment, which contributes to effective marine protection and the governance goals of Operation Phakisa.

This, and SANSA's other technical advisory services, support the development of South Africa's Ocean and Coasts Information System, which is a Phakisa-Ocean Economy deliverable to further improve marine protection and governance.



**Detecting ships with SPOT-6 satellite imagery in the vicinity of the Cape Town harbour on 25 March 2015**



**Water Level estimation**



**Durban harbour**



## ENSURING ENERGY SECURITY

South Africa's energy challenges significantly affect its economic growth. SANSA's products and services supports government's energy solutions, which include maintaining Eskom power stations, managing the electricity demand and enhancing the generation capacity of the national power grid.

### **Protecting the national power grid**

During the past year, SANSA and Eskom joined forces in a Memorandum of Understanding (MoU) to protect the national power grid from the potentially harmful impact of space weather on utility's Interconnected Power System (IPS). The collaboration entails data acquisition and communication, space weather incident management, including the use of related tools and event alerts, expert support, joint research and publications as well as public education and training.

Furthermore, SANSA supplies daily MODIS data that is used in the CSIR Advanced Fire Information Management System (AFIS) that warns Eskom and relevant stakeholders on fire episodes that could impact on Eskom powerlines.

SANSA commissioned a Magnetotellurometer (MT) station near the Koeberg Power station under a hosting agreement with Eskom. This is the first MT-station co-located with a power station that is equipped with a specialised instrument to measure Geomagnetically Induced Currents (GICs). These currents can cause

extensive damage to power transformers and create IPS instability. Data from the MT station will be used to estimate the surface impedance of the ground as an important parameter in modelling GICs in the power network locally and verifying the algorithms that SANSA is developing to estimate GICs.



***The SANSA and Eskom teams at the signing of the SANSA/Eskom MoU.***

SANSA installed a pair of magnetometers under and near a power line to measure GICs in the power line. A first for South Africa, this significant accomplishment proved the feasibility of using a non-invasive remote sensing method to measure GICs in the South African energy network and validated the GIC prediction models that are being developed as part of national and international space weather research programmes.

The SANSA magnetometers, installed under the 400 kV power line near Botrivier in the Western Cape, recorded significant GICs in the power line induced by a solar storm on 17 March 2015.

SANSA researchers also made significant progress in developing a GIC proxy, which is based on solar wind measurements, to improve GIC prediction for space weather applications to mitigate the potentially devastating impact of space weather events on the national power grid.

Satellite-based augmentation technology aims to reduce air accidents and increase flight safety. The augmentation of a global navigation satellite system (GNSS) improves the accuracy, reliability and availability of information used for in-flight calculations.



## ENSURING NATIONAL SECURITY AND SAFETY

Along South Africa's borders with Mozambique, Botswana, Namibia, Lesotho and Swaziland, which cover approximately 3 500 km, only 19 points are designated for the movement of commercial goods. SANSA's utilisation of specialised space-related knowledge is making a significant contribution to keeping our country safe and secure – on land, sea and in the air.

### Aviation safety

Only 3% of global air traffic crosses the African continent, yet about 20% of all aviation accidents in the world occur in Africa. SANSA and UK-based Avanti Communications have partnered in the SBAS-Africa air navigation project that uses satellite-based augmentation to improve aviation safety and encourage positive developments in the wider aviation sector in the African region.

The project promotes the use of Global Navigation Satellite System (GNSS)-based flight operations for greater flight safety and encourages regional integration through new routes, access to aiReports in remote regions, commercial opportunities for airlines, reduced transport costs and an improved response to humanitarian interventions. The SBAS applications can also be used in other transport sectors.

### Maritime and cross-border security

In response to a recommendation by the Department of Science and Technology, and aligned with Operation



Phakisa, a SBAS application was investigated for the maritime domain. As a result, the South African Maritime Safety Agency (SAMSA) and Transnet National Ports Authority (NPA) implemented two SBAS trials aboard the SA Agulhas II on its voyage from Cape Town to the Marion and Gough Islands in February and March 2016 to test the SBAS out-of-range signal performance. The trial results will inform the NPA's decision about replacing its Differential Global Positioning System (DGPS) with satellite technology, as well as the emerging regulations from the International Maritime Organisation (IMO).

Similar to other countries with vast coastal and other borders, South Africa is affected by the cross-border smuggling of illegal weapons and drugs. Using satellite technologies for maritime and cross-border surveillance helps the government to protect our ports, coastal borders and transportation on the high seas.

As a vital service to the maritime sector, SANSA recently developed a space weather information display system for the Maritime Control Centre at the Institute for Maritime Technology (IMT) in Simon's Town. The system, which displays space weather effects in real-time, is improving the efficiency with which the South African Navy now sets communications paths for vessels at sea. SANSA also ran regular training workshops for defence users to improve their space weather awareness and high-frequency (HF) propagation path prediction and space weather data interpretation skills.

SANSA provided maritime electric and magnetic signature management services to the South African Navy, through the IMT. These included the measuring of

electric fields around sea vessels to identify problems with the vessel's cathodic protection system. Left undetected, these problems can cause significant damage to marine vessels. Other SANSA services included landing compass calibrations (approximately 150 per year) and magnetic sensor sourcing and integration on dynamic platforms such as satellites and unmanned aerial vehicles (UAVs).



***The space environment can impact our technology capabilities on Earth.***

## Defence security

SANSA's space weather information, interpretation and support services to the South African National Defence Force (SANDF) included HF propagation path predictions, which enabled SANDF users (including special forces) to prepare HF communications plans well in advance of operations. SANSA also provides the SANDF with space weather reports to adjust their communications channels and space weather information that assists with daily operations and ensures effective communication with troops and other military personnel on the ground.

During the 2015/16 financial year, SANSA presented 17 training courses to approximately 200 key personnel, largely from the military sector and involved in safety-critical activities on aircraft, at its premises in Hermanus. The commitment by the SANDF to develop the skills of military personnel to improve national security, equates to a sound return on investment and increased capability to fulfil its security mandate.



***A training course for the SANDF being presented at the SANSA offices***



# CREATING KNOWLEDGE AND SKILLS

## Research outputs

SANSA uses a productivity score to measure its contribution to space science research. This includes papers published in high-impact, internationally-reviewed journals, as well as contributions to expert textbooks, NRF ratings for its researchers and the number of research students who graduate under SANSA supervision.

During the past year, we contributed to new knowledge in space science through 26 published papers, approximately R4.5 million in research grant funding, contributions to two books, four new NRF-rated researchers and nine graduates. Our researchers also participated in conferences/workshops in 10 different countries, including two in Africa and five in Europe, as session chairmen and/or delivering papers, posters and invited presentations on space science research.

## Knowledge-sharing and international partnerships

Foreign visitors to SANSA included researchers from, inter alia, the UK, India and Japan who engaged with our research students, university partners, local researchers and the public. Over 100 international and African delegates attended four international conferences in Hermanus. These included the first biennial European

Incoherent Scatter Radar (EISCAT) symposium held in the Southern Hemisphere, which incorporated a radar school during which international researchers shared specialised knowledge with local students.



### ***Students and international guests at the EISCAT-42 AM symposium***

SANSA researchers participated in three exchange visits to the UK under the UK Space Agency's International Partnerships in Space Project (IPSP) to share knowledge on forecasting, predicting and verifying space weather events and assessing the socio-economic benefits of space weather forecasting, as well as improving partnerships and knowledge exchange between space agencies in the USA, UK and South Africa. Reciprocal visits to South Africa in January and February 2016 contributed towards enhancing SANSA's knowledge about the impact of space weather events on the aviation sector. Benefits included assistance with the development of a value proposition for space weather and strengthened international relations.

Establishing and fostering global partnerships benefit both SANSA and South Africa's space research community by

creating/utilising unique opportunities for new scientific discoveries, essential networks and discipline-specific experiences, as well as driving innovation and technology applications that benefit society.

### Polar space research

SANSA operates 80% of the shore-based scientific equipment at the South African National Antarctic Expedition (SANAE) base in Antarctica. High-quality data was again captured from SANSA's space monitoring instrumentation during a successful 2015 overwintering period. The flagship SuperDARN radar project is the longest-running instrument at the base and the radar antenna system was upgraded to full-system capability by the overwintering team in December 2015. The SANSA team collaborated with Italy's Istituto Nazionale di Geofisica e Vulcanologia (INGV) to deploy a new DemoGrape GPS experiment. This will improve satellite high-precision positioning, increase the accuracy of satellite navigation in the Polar region and contribute to developing new scientific and technological applications in Antarctica.



***SANSA engineers working on the digital SuperDARN HF radar located at the South African Antarctic Base, SANAE IV***

Two Scanning Doppler Imagers (SDIs) were also deployed at the McMurdo and South Pole stations in collaboration with the US Antarctic Programme. This was a significant milestone as only seven SDIs exist in the world, with two now deployed successfully in Antarctica. SDI data support wind and temperature research in the upper-atmosphere, at a height of between 100 and 300 km, where space weather events affect the atmosphere.

### Optical space research

SANSA completed the installation of a state-of-the-art Optical Space Research Laboratory (OSR) at the South African Astronomical Observatory (SAAO) in Sutherland. The facility will provide crucial space science data to meet national and international obligations, raise the standard of South African research, supply information about the Earth's middle and upper atmosphere and enhance scientific development.

The laboratory will host joint projects with international partners, including the German Space Agency (DLR) and universities in the US such as Boston, Clemson and Utah State. The DLR will use the OSR to track space debris in a project that could involve a number of South African researchers, engineers and students.

During the past year, our researchers also captured the first ground-based, optical observations of sprites in South Africa at Sutherland. Sprites are a gas discharge phenomenon in the mesosphere that is triggered by lightning strikes and have never been recorded or studied locally, before now. The observations can be used to remotely study the middle atmosphere, which cannot be accessed directly by aircraft, balloons or satellites. New observations, using multiple simultaneous cameras with optical filters, will now be undertaken for the first time.

The first South African image of an isolated “jellyfish” sprite, initiated by a single lightning strike, approximately 300 km north-east of Sutherland.



***A night-vision TV camera was used to capture the first images of sprites in South Africa***

## Remote sensing and malaria research

Despite the apparent progress in reducing the prevalence of malaria, areas such as north-eastern Kwa-Zulu Natal and parts of Mpumalanga and Limpopo are still malaria-endemic. SANSA is collaborating with the Institut de Recherche pour le Développement (IRD), a French biomedical and public health research institution, Aix-Marseille University, INSERM and Centre for Sustainable Malaria Control at the University of Pretoria to find ways to eradicate the persistent scourge of malaria in those areas.

The research team identified temperature, rainfall and relative humidity as the three main climatic factors that favour the transmission of malaria and is using remote sensing technology to investigate the impact of climate variability and change on the occurrence and intensity of malaria.

The technology will assist in monitoring changes in vegetation and water bodies, as well as the movement of people by tracking the increase of newly-built structures in designated areas. In many instances, climate change has changed the habitat of mosquito breeding sites, while people with low immunity become exposed to malaria by moving unwittingly, for economic reasons, to an area with a high malaria transmission rate.

The research team uses remote sensing technologies to map the extent of water bodies and vegetation and make recommendations to the relevant authorities. Identifying the location of unpolluted dams, streams, riverbeds and ponds with warm, moist conditions that create ideal breeding areas for vector mosquitos, as well as where the clearing of vegetation will create similarly ideal sunlit pools, can support decisions and assist with planning in the fight

against this dread disease. The use of space technology enables informed decision-making and intervention prioritisation, especially in areas without field data.



### Encouraging SMME participation in technology innovation

SANSA partnered with Airbus Defence and Space (ADS) to support the launch of The Innovation Hub/City of Tshwane OpenIX Open Innovation Exchange as an innovation challenge owner. Given the large resource of multi-sensor satellite data at SANSA and ADS and significant scope to increase South Africa's commercial competitiveness and societal benefit from Earth observation data, the SANSA/ADS innovation challenge called for novel multi-sensor satellite data applications.

The 28 proposals, from 11 start-up, 11 industry and seven public participants, covered agriculture, information technology, health, urban planning, climate change, disaster monitoring and security. Following a rigorous assessment process, the DroneClouds won with a cloud-based innovation that uses aerial imagery and satellites to

identify early-stage plant stress. The application delivers the processed results on a desktop and mobile app and can assist farmers to increase crop yields. Early plant stress identification can inform decisions about water, fertiliser and pesticides use and potentially save farmers time and money. The DroneClouds team won a trip to Toulouse in France for site visits to Geo Intelligence, Space Systems, Interspace and the Airbus commercial aircraft assembly line, as well as access to Airbus Group companies to help commercialise their service.

As the four runners-up, Cognitive Systems (for complex adaptive systems from complex data streams), GIS Cape Town (artisanal mining and human rights), Mobbisurance (mobile-based insurance for emerging farmers) and My Smart Farm (benchmarking agricultural field performance) each received a 12-month incubation support package from The Innovation Hub.



***The participants in the SANSA/ADS satellite data innovation challenge***

## Student development

The SANSA student development programme is an important contributor to skills development in the space sector. During the 2015/16 financial year, SANSA supported 48 postgraduate students and five interns in space science, Earth observation and engineering. As a non-degree granting institution, SANSA's student development programme is undertaken in collaboration with various universities. Depending on their project and supervision arrangements, MSc and PhD students can be based at a SANSA facility or their university. Students benefit through exposure to a research culture and through working closely with researchers at SANSA, as well as interacting and networking with international visitors, often experts in their fields as well as attending and presenting their work at SANSA-hosted international conferences.



***Students hosted by SANSA***

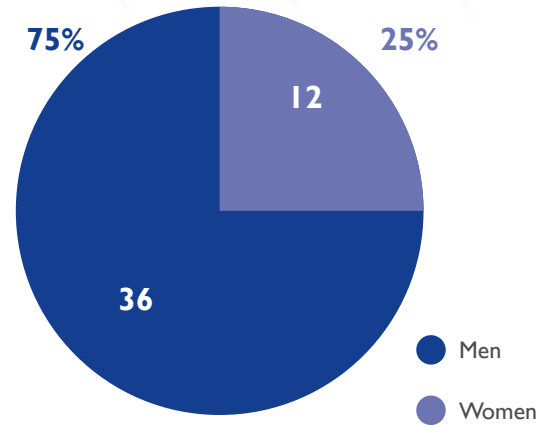
The Agency also identifies suitable opportunities for postgraduate students to increase their exposure and skills base. During 2015/16, two students attended the 2015 Space Weather Summer Camp in Germany to accelerate their growth and develop critical skills in space weather research. SANSA aims to increase the number of South African students exposed to this excellent space science knowledge development programme by becoming a full member in 2016 and hosting part of the camp in South Africa. The studentship programme has begun to yield exceptional scientists. In its first two years of implementation, one of the four scientists completed studies with a Cum Laude from UKZN.



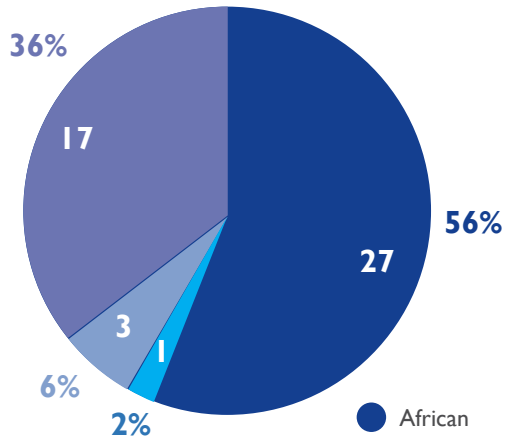
***National Astrophysics and Space Science Programme***

**The profile of the 48 postgraduate students supported by SANSa in the 2015/16 financial year**

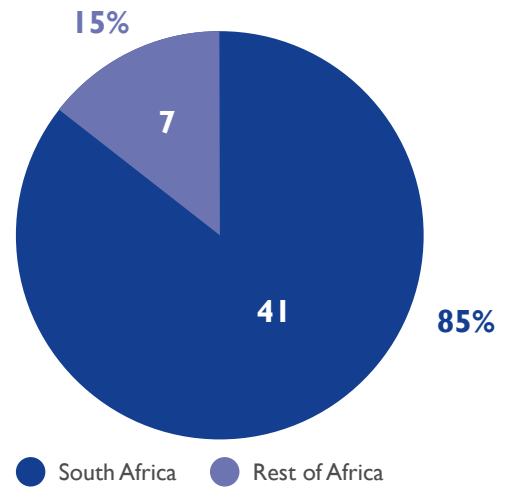
Student Gender Profile 2015/2016



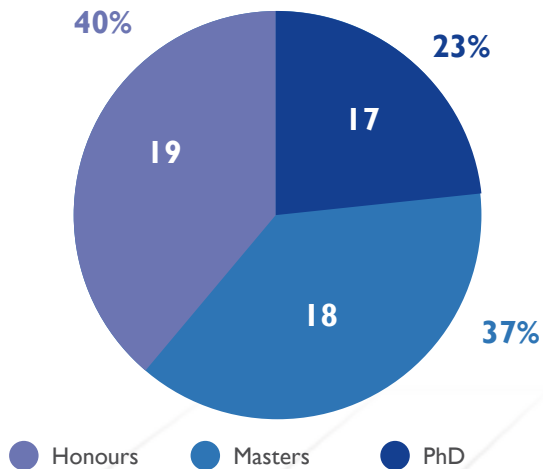
Student Equity Profile 2015/2016



Student Nationality Profile 2015/2016



Student Degree Profile 2015/2016





# SCIENCE ADVANCEMENT AND PUBLIC ENGAGEMENT

During the reporting period, SANSA's science advancement and public engagement activities reached 15 347 learners in all nine provinces. Specific activities included a successful National Science Week with 435 visitors attending an open day and exhibitions hosted in Hermanus and Pretoria.

Youth engagement included reaching 4 504 youths through National Science Week events in Limpopo, North West, Mpumalanga, Western, Eastern and Northern Cape; 266 young people from six schools in Kimberley during the Science Tube science festival in the Northern Cape; and 186 members of the Zwelihle and Mount Pleasant communities in the Overstrand District Municipality. SANSA's mobile space lab also visited schools and townships in the Northern, Eastern and Western Cape to introduce learners to space science and technology-related career opportunities.

Under the aegis of the Women in Physics in South Africa (WiPiSA) programme, 24 female Physics students from the University of Cape Town (UCT) visited SANSA, while seven of our female researchers and postgraduate students shared career opportunities for women in science and technology with over 1 000 learners in George and Knysna.

During 2015, SANSA's popular annual school holiday programme attracted 117 learners between the ages



of 6-12 years. The learners participated in practical, curriculum-linked science and technology activities that encouraged and stimulated their interest in space science.

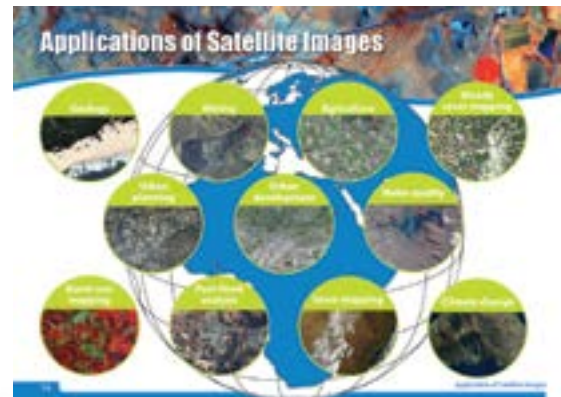


**Learners participating in SANSA's popular school holiday programme in 2015**

## Building capacity in space science and technology

Higher Education Institutions across South Africa are using SANSA's human capacity development products. Examples include the Fundisa Disk and student portal, which were updated in 2015 with newly-acquired satellite data and more open source software. According to a recent customer survey, the Fundisa Disk is used widely by students and for training at universities, most actively in the environmental science, botany, disaster management, town planning, geography, agriculture, education, hydrology and zoology departments.

During 2015, SANSA published the first South African Remote Sensing Atlas with an online version that shows the various applications of Earth observation data.



**South African Remote Sensing Atlas**



## TECHNOLOGY AND INNOVATION

### Ground stations and hosting services

The successful installation of new antenna at SANSA's facility in Hartebeesthoek continues to entrench the Agency's global positioning as a leader in this field. During the year under review, ground segment installations included an antenna for Spire, an international data collection and analysis company; a monitoring station for Japan's Quasi-Zenith Satellites System (QZSS) to provide high-accuracy satellite positioning services over almost all of Japan; a monitoring station for Norway's Kongsberg Satellite Services (KSAT) as part of its network services for Japan's NEC Corporation that is installing the QZSS ground control facilities globally; and a new antenna system as part of the CNES CORMORAN project.

In addition, SANSA provided launch, transfer orbit (TOSS), launch and early-orbit phase (LEOP) and in-orbit transfer (IOT) support services for 15 space missions during the 2015/16 financial year. Clients included Intelsat, CNES (the French space agency) and Telesat.



***The international installation team***

## Space engineering

Highlights in this area included the development of life-cycle costing model for the satellite development programme to assist with the planning and development of the satellite

The EO-Sat1 satellite contract has, since activation, created 10 new jobs at Spaceteq further 10 jobs within the South African space industry that works directly with the EO-Sat1 development. In addition to the 120 personnel employed in South Africa's space sector, it is foreseen that 40 new scientific and engineering jobs will be created through the EO-Sat1 project in the long term. These skills are being developed to manage any future space-related projects. Currently, SANSA is supporting seven engineering students through its HCD programme.

Since the start of the EO-Sat1 project, many SMMEs have been impacted directly: Four of these include:

- Astrofica Technologies (Pty) Ltd (100% Black-owned, 50% Black Women-owned)
- Group 6 Technology and Infrastructure (Pty) Ltd (75% Black-owned)
- Luvhona Engineering and Consulting Partners (100% Black Women-owned)
- Connecta (Pty) Ltd (100% Black Women-owned).

Other significant milestones included the procurement of the optics and sensor engineering model for the satellite programme; determination of the best options for the critically important assembly, integration and testing (AIT) facilities to support the local space industry and other technology areas in South Africa; a prototype of the satellite reaction wheel and on-board computer (OBC); and a communications unit for VHF/UHF communications.



### ***Future satellite design***



# PERFORMANCE OVERVIEW





## PERFORMANCE HIGHLIGHTS

SANSA strives to achieve its goals by giving effect to the following objectives:

- promoting the peaceful use of space
- supporting the creation of an environment conducive to industrial development in space technology
- fostering research in space science, communications, navigation and space physics
- advancing scientific, engineering and technological competencies and capabilities through human capital development (HCD), outreach programmes and infrastructure development
- fostering international cooperation in space-related activities.

### Space technology for socio-economic benefit

Activities during the past year to address South Africa's challenges were focused in four main areas, namely delivering national geospatial decision-support data products and land-use and land-cover base information layers, as well as space weather and magnetic technology services.

SANSA supplemented its invaluable satellite imagery data bank with data from various satellites including SPOT, Landsat, MODIS and CBERS-4 to provide the country and the region with decision-support products. During the review period, the Agency distributed 47 485 images and

empowered decision-makers with geospatial information and intelligence.

The production of information layers for human settlements and national water, vegetation and flood risk management tools were further refined to strengthen SANSAs service delivery and improve the decision-making ability of customers in spatial planning and water, agriculture and disaster management. The completion of the 2012 and 2014 human settlement information layers will, for instance, enable a better analysis of human settlement changes within the context of rapid urbanisation.

Space weather services and space science research are valuable contributors to South Africa's national security. SANSAs provides the South African National Defence Force (SANDF) with a number of services, including high-frequency communications prediction, geospatial information and training.

The new space weather information platform at the Maritime Control Centre of the Institute for Maritime Technology (IMT) was developed specifically to facilitate real-time space weather monitoring to optimise the communications paths for vessels at sea. The platform is complemented by a portfolio of magnetic services that include providing the IMT and South African Navy with electromagnetic navigation ground support, protecting South African vessels from corrosion and increasing their safety and reliability, while saving the country millions of Rands.

## Conducting cutting-edge research, development and innovation in space science

SANSAs research continued to set new standards in space-related knowledge, probing the unknown and questioning the underlying assumptions of our scientific discourse. First-time achievements included the determination that the Sudden Stratospheric Warming also affects the upper thermosphere, which will improve upper atmosphere composition modelling, and observation of sprites in South Africa using optical instrumentation.

Our researchers also probed other areas such as ionospheric densities; the derivation of nonlinear plasma densities (working with the University of the Western Cape); ion-acoustic solitons; high-frequency nonlinear waves; sudden magnetic storm commencements; geomagnetically induced currents; the prediction of Induced Electric Field Components during geomagnetic storms; travelling ionospheric disturbances to name a few of the many areas covered. Earth observation research provides new knowledge about the contribution of Earth observation data to our understanding of the spatial and temporal distribution of vector-borne diseases and invasive species under environmental and climate change conditions.

This wide scope of knowledge creation resulted in SANSAs productivity score of 1 992. This included 26 research publications in high-impact research journals, approximately R4.5 million in research grant funding, four researchers with newly-achieved NRF ratings, two book contributions and nine SANSAs-supervised graduates, including two PhDs. SANSAs researchers also participated in research conferences/workshops in ten different countries, including two in Africa and five in Europe.

## Building capacity and developing skills

Parallel to South Africa's quest towards a knowledge economy is the need to develop an extensive knowledge workforce. In this regard, SANSA's 2015/16 student development programmes supported 53 postgraduate students and interns studying space science, Earth observation and engineering. Addressing the critical skills shortages in these areas will improve South Africa's global competitiveness and reduce the currently high trade deficit in high-tech products and services.

SANSA also directly engaged with 15 347 youth and public through various science advancement initiatives to increase the uptake of science, engineering and technology at schools and create a wide pipeline of skills in these areas. The initiatives, such as science exhibits/festivals, mobile outreach activities and Science Centre activities, continue to excite, challenge and expose young people to new opportunities in science and technology. The Fundisa Disk HCD resources and newly-completed South African Remote Sensing Atlas are some of the most sought-after resources at South African universities.

## High-accuracy satellite global positioning system

As in previous years, SANSA's programmes continued to position South Africa favourably in the space community globally. An example is SANSA's collaboration with Avanti Communications on aviation safety through the SBAS-Africa project, a crucial air navigation project in Africa. Since SBAS services also contribute to other transport domains, a SBAS application in the maritime domain is also being investigated.

During the past year, SANSA conducted 12 launch supports, one drift support and two in-orbit tests. Some of the missions supported included C-Band TOSS support for Intelsat 34, TOSS support for the ABS-3A, Ku-Band transfer-orbit support for about ten days and support for the Jason-3 ocean altimetry mission (ocean surface topography measurements to support ocean circulation and climate change research).

The successful delivery of these support services enable global navigation, communications, science, environmental management and deep space exploration and indirectly contributes to the advancement of humanity and improved livelihoods. SANSA's navigation activities also increased with launch and early-orbit phase support of the Galileo-9 and Galileo-10 satellites.

## Positioning SANSA as an emerging space player

SANSA fosters international partnerships to embrace collaboration with experienced nations, position South Africa as a space-faring nation and support its drive towards becoming a fully-fledged space agency with its own launch capabilities. SANSA's role within the Committee of Earth Observation Satellites (CEOS) and particularly as Chair of the CEOS Working Group on Capacity Building and Data Democracy confirm its standing within the global space community and continually opens up opportunities to support international Earth observation bodies, such as GEO, and Africa initiatives, such as AfriGEOSS.

During the past year, a number of international research visitors from the UK, India, Japan and France visited South Africa to engage with SANSA's scientists, students, university partners, researchers and the public.



SANSA's participation and leading role in Africa through, inter alia, the European Union-funded and African Union coordinated programme; and the Monitoring for the Environment and Security in Africa (MESA) and TIGER regional and international projects, affirms its position as one of the leading space agencies in Africa.

SANSA hosted the TIGER Capacity Building Facility workshop at the DST with about 30 participants from African countries (Swaziland, Egypt, Ghana, Kenya, DRC, Uganda, Ethiopia, Morocco and Madagascar) and water management professionals in South Africa in attendance. The main objective of the course was to empower African scientists to develop their scientific skills and the technical capacity to make the best use of Earth observation technology to better understand, assess and monitor the status of water resources in Africa as well as the potential impacts of climate change. The recent signing of the MoU between SANSA and the Botswana Department of Meteorological Service (BDMS)/SADC-Climate Service Centre (CSC), representing MESA SADC-THEMA, further strengthens SANSA's position in Africa.

The SANSA/JICA partnership remains a significant international partnership. Benefits include hardware, software, data and tools for processing Synthetic Aperture Radar (SAR). These benefits have been extended to over 50 national stakeholders through targeted SAR training workshops and the annual training and tour of space technology institutions in Japan. SAR training is a national prerequisite to effectively support Operation Phakisa in unlocking the potential of South Africa's oceans economy.

SANSA also hosted six international workshops at its

various facilities with just over 100 international and African delegates. The events included the biennial European Incoherent Scatter Radar (EISCAT) symposium, which was held in the Southern Hemisphere for the first time.

SANSA's partnerships within the African region also continued to grow, especially in the context of the African Resource Management Constellation (ARMC).

## Student development, science advancement and public engagement

SANSA reached over 60 000 learners during five national science festivals, including the Science Tube in Thohoyandou and Kimberly, SA Agulhas II exhibition at Cape Town Harbour, Touwsriver Science Expo and SciFest Africa in Grahamstown. The engagements included the SANSA Aspire to Inspire programme, which exposes learners to different STEM career opportunities. Learners conveyed their interest in careers through feedback surveys. These engagements highlighted the importance of the interface between science and society as part of the DST Public Engagement Framework.

SANSA gained exposure during a number of successful World Space Week and National Science Week (NSW) events including a Space Agency Open Day, local community expos, public outreach activities and rural school visits.

The official NSW launch and annual Sasol TechnoX science exhibition "*Today's minds, tomorrow's future*" were held in-tandem in Secunda in Mpumalanga. Sasol Techno X offers themed displays, workshops, tours, talks and hands-on activities to stimulate the interest of learners, educators

and the general public in the endless possibilities of science, maths, engineering and technology. As an exhibitor, SANSA communicated with more than 700 learners by, *inter alia*, using robotic antenna to demonstrate satellite tracking and discussing the benefits of satellites to society.

SANSA researchers and postgraduate students participated in its annual TUTOR programme to assist Grades 11 and 12 learners with curriculum-based mathematics and physical science. This social responsibility initiative enables learners to significantly improve their math and science results.

Under the NRF/DST Internship and South African Agency for Science and Technology Advancement (SAASTA) Volunteers Programme, SANSA provided four young unemployed graduates with internships and volunteer opportunities and took on two students during the 2015/16 summer vacation period. These interventions provide students with valuable work experience to improve their employability as graduates.

During the review period, just under 500 members of the public attended the six lectures in Hermanus and one in Cape Town. SANSA uses these lectures in the Western Cape to foster relationships with local and international stakeholders.

Science Centre personnel countrywide continuously interact with learners and visitors to promote science and technology. The DST and SAASTA approached and funded SANSA to develop and present a training programme for science centre representatives to enrich their knowledge about space science and technology. The programme included presentations by SANSA, Neotel, New Space Systems, Cape Peninsula University of Technology (CPUT) and Denel Spaceteq.

SANSA also supported the Unisa 2015 'Girl Power' community engagement project by providing information on the electromagnetic spectrum, GIS and remote sensing for a project on 'light and light-based technology' in line with 2015 as the International Year of Light.

SANSA participated in the DST-sponsored 2015 Space Science Roadshow and 2015 World Space Week by, *inter alia*, partnering with the Secunda Amateur Radio Club (SARL) in a Balloon-Sat launch. Forty-five senior learners from four schools in Secunda, Mpumalanga, built their own payloads to launch on-board the balloon satellites.



***Developing young women in science***



## PERFORMANCE AGAINST TARGETS

During the 2015/16 financial year, SANSA's Corporate Support, Earth Observation, Space Operations, Space Science and Space Engineering programmes achieved 17 out of 19 key performance indicators or an 89% success rate.



**Table 1: Performance against targets for the 2015/16 financial year**

Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
Goal 1	Address South Africa's challenges through space services and products	T1.1 Deliver four high-impact national products and applications	Quarterly	4	4			The quarterly numbers are not accumulative as some of the projects are continuous right through the year. Targets are modified for 2016/17 to accommodate the fact
		T1.2 Develop two government policy support tools	Annually	2	2	Target met		The policies are: the use of EO data in Spatial Planning policy and Space Weather Impacts for Aviation policy
Goal 2	Lead high-impact collaborative R&D on a national scale	T2.1 Achieve a research productivity score of 750	Quarterly	750	1 992	Exceeded Extra papers and book chapter published, also additional student graduates	Targets to be reviewed next year based on realistic baseline data	

Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
Goal 3	Develop national human capacity and ensure transformation	T3.1 Directly engage 8 000 young people	Quarterly	8 000	18 769	Exceeded  Additional festival workshops and SciFest Africa contributed to increased numbers	None	
		T3.2 Support 40 students	Quarterly	40	53	Exceeded  Supported new Honours students for the first time	None	Note 1: Reported numbers include interns (strategic objective SO3.2)  Note 2: Q1 numbers overstated, actual number should have been 45
Goal 4	Enhance the competitiveness of the South African space industry	T4.1.1 Achieve a successful satellite pass monitoring rate for Earth observation	Quarterly	Actual	42 686	Exceeded		
				Total	42 833			
				97%	99.7%			

Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
		T4.1.2 Total income generated from space operations	Annually	R58.3 million	R77 million	Exceeded Proton failure resulted in significant catch-up by customers and the effect of the exchange rate		
		T4.1.3 Total investment from space operations money in other SANSA programmes	Annually	R10.176 million	R20 million	Exceeded Increase in number of passes and significant increase in exchange rate		
		T4.2.1 Number of direct jobs supported externally through SANSA programme contracting	Annually	40	53	Exceeded Additional support required for the technical development of the project		
		T4.2.2 Progress status on the EO-Sat1 development project	Annually	25%	21%	Target not met due to uncertainty in satellite funding		Uncertainty in satellite funding imposed work restrictions and caused delays to some work-streams

Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
		T4.2.3 Total contract expenditure to SMEs for core space projects	Annually	R2.4 million	R7.8 million	Exceeded Increase due to more system engineering work than originally anticipated		
		T4.2.4 Total contract expenditure out-sourced to the broad space-related industry for core space projects	Annually	R50 million	R98.1 million	Exceeded Phase 1.2 activated earlier than originally planned		
Goal 5	Develop active global partnerships	T5.1 Global partnerships contribute an equivalent of 5% to the space programme revenue	Quarterly	Actual: R4 241 704.81 Total: R1 004 746 272 5%	2%	Target not met achieved SANSA revenue less than projected amount		Targets to be reviewed next year, based on realistic baseline data

Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
Goal 6	Ensure the growth and sustainability of SANSA	T6.1.1 Total SANSA income	Annually	R223 million	R238 million	Exceeded		
		T6.1.2 Estimated annual monetised impact	Annually	R105 million	R299.6 million	Exceeded Costs SA would have incurred through listed prices due to weaker Rand about R350 m; actual costs from DRS about R50 m		
		T6.1.3 SANSA's public value awareness	Annually	50%	93%	Exceeded	Target needs to be reviewed	Measured through a survey among SANSA's national stakeholders
		T6.2 30% NSP implementation	Annually	30%	52%	Exceeded	Targets needs review and assessment review needs to be made more robust	



Goal		KPI	Reporting cycle	Annual target	Annual actual	Reasons for variance	Corrective steps/ remarks	Comments
Goal 7	Transform SANSA into a high-performance Agency	T7.1.1 Four initiatives that enhance organisational performance	Quarterly	4	4	Target met		
		T7.1.2 Percentage proportional representation of permanent staff from designated groups at top two management levels (managers, senior managers)	Quarterly	65%	71%	Exceeded	Pursuing a high transformation drive	Reported achievements for Quarters 1,2 and 3 adjusted

# PROGRAMME PERFORMANCE



# PROGRAMME 1: CORPORATE SUPPORT

## Highlights

- **82% attendance at Board meetings**
- **R403 million total procurement value (awards allocated)**
- **R160 million (70%) BEE expenditure for Levels 1 to 3**
- **93% staff representative of designated groups**
- **86% resolution of internal audit findings**

## Programme Structure and Functional Scope

The Corporate Support Programme provides management, administrative and technical support across all operating units. This support facilitates the operational efficiency and cost-effective management that is aligned with sound governance principles and the seamless integration and collaboration between SANSA directorates.



## Board, Management Structure and Governance

SANSA is established in terms of the South African National Space Agency Act, 36 of 2008, as amended (SANSA Act). The Agency is governed by the Public Finance Management Act, 1 of 1999 (PFMA) and related National Treasury regulations, and is a Schedule 3A entity. In addition, SANSA strives to abide by the highest standards of governance and best practice.

### Board Role and Composition

The Board is the Accounting Authority in terms of the PFMA and reports to the Minister of Science and Technology. The Board is responsible for providing SANSA with strategic direction and leadership and ensuring that the Agency abides by good corporate governance principles. The role and responsibilities of the Board are set out in terms of the PFMA, SANSA Act, as amended, and the Board Charter.

The Minister of Science and Technology takes into account the appropriate mix of skills and qualifications when considering suitable candidates for appointment to the Board. As at 31 March 2016, the Board consisted of a non-executive Chairman, 14 non-executive members and the Chief Executive Officer as an ex-officio member, as indicated in Table 2.

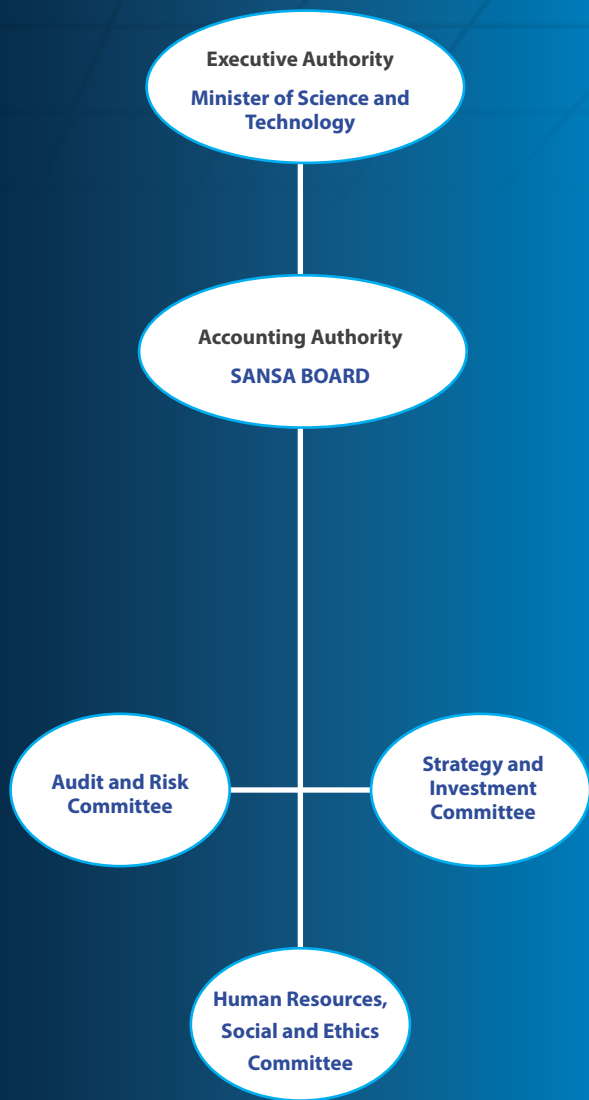
The responsibilities of the Board are dictated primarily by the SANSA Act and the PFMA. According to its legislative powers, specifically as stipulated in Section 9 of the SANSA Act, the Board's main function and responsibility are to add significant value to SANSA by:

- performing any function imposed upon it in accordance with the policy issued by the Minister and in terms of the SANSA Act.
- overseeing the functions of the Agency
- monitoring the research priorities and programmes of the Agency
- giving effect to the strategy of the Agency in the performance of its functions
- notifying the Minister immediately of any matter that may prevent or materially affect the achievement of the objectives of the Agency
- establishing or disbanding the Agency's organisational divisions, as appropriate, after consultation with the Minister.

### Board Charter

The Charter outlines all other responsibilities of the Board as follows:

- Providing effective leadership based on an ethical foundation and ensuring that the Agency is seen as a responsible citizen.
- Acting as the custodian of corporate governance.
- Setting SANSA's direction, strategies and financial objectives and ensuring that the necessary resources are in place for the Agency to meet its objectives.
- Identifying and regularly monitoring SANSA's key risk areas and performance indicators.
- Ensuring that SANSA has an effective and independent Audit Committee.



**Board and standing Board  
Committees structure.**

- Ensuring that SANSa complies with the relevant laws, regulations and codes of business practice.
- Overseeing the strategy and adoption of best practices in the rollout and use of ICT systems and procedures.
- Overseeing the effective management of stakeholder relations and ensuring that the performance of the Agency is managed and measured to enhance SANSa's reputation.
- Considering business rescue measures or other turnaround mechanisms as soon as the Agency is financially distressed as defined in King III.
- Ensuring that the performance of the Executive Management is regularly assessed and monitored.
- Supporting scientific space research-related programmes or projects.

### Composition of the Board

The Board consisted of 15 non-executive members and one ex-officio member for the 2015/16 financial year and discharged its duties assisted by the following standing committees:

- Audit and Risk Committee
- Strategy and Investment Committee
- Human Resources, Social and Ethics Committee.

**Table 2: SANSA Board Members**

Board Member	Designation	Date appointed	Term ended/ ends	Highest qualification
Joy-Marie Lawrence	Chairman	1 June 2010	31 May 2014	LLM (Masters in Law)
		1 June 2014 (extended)	31 August 2014	Executive MBA (with distinction)
		1 September 2014 (re-appointed)	To date	
Mbali Mfeka	Chairman	1 September 2014	To date	BCom (Hons)
	Audit and Risk Committee			Master's in Business Leadership (MBL)
Omar Latiff	Member	1 September 2014	September 2015	BCom (Economics)
	Audit and Risk Committee			BCompt (Hons) CA(SA)
Johan Prinsloo	Member	1 September 2014	To date	BEng (Electronic Engineering)
	Audit and Risk Committee			
Simphiwe Hamilton	Member	1 September 2014	To date	BMil
	Audit and Risk Committee			BMil (Hons) (Politics) MMil (Defence Administration)
Potlaki Maine	Member Audit and Risk Committee	1 June 2010	31 May 2014	MSc (Information Science)
		1 June 2014 (extended)	31 August 2014	
		1 September 2014 (re-appointed)	To date	
Matsie Matookane	Chairman	1 September 2014	To date	MBA
	HR, Social and Ethics Committee			MSLIS
Gaborekwe Khambule	Member HR, Social and Ethics Committee	1 May 2013	31 May 2014	DMS
		1 June 2014 (extended)	31 August 2014	MAP
		1 September 2014 (re-appointed)	To date	NHDP (Meteorology) MBA
Willie van Biljon	Member	1 September 2014	To date	BSc (Eng) (Mech) MSc (Eng) (Mech)
	HR, Social and Ethics Committee			

Board Member	Designation	Date appointed	Term ended/ ends	Highest qualification
Vincent Gore	Member	1 June 2010	31 May 2014	BSc (Eng) (Elec)
	HR, Social and Ethics Committee	1 June 2014 (extended)	31 August 2014	
		1 June 2014 (re-appointed)	To date	
Ashley Naidoo	Member	1 September 2014	To date	BSc (Paed) BSc (Hons) MSc (Marine Zoology)
	HR, Social and Ethics Committee			
Marius Rezelman	Chairman	1 May 2013	31 May 2014	BCom (Hons)
	Strategy and Investment Committee	1 June 2014 (extended)	31 August 2014	
		1 September 2014 (re-appointed)	To date	
Prof Ramesh Bharuthram	Member	1 September 2014	To date	PhD (Theoretical Plasma Physics)
	Strategy and Investment Committee			
Eugene Jansen	Member	1 September 2014	To date	MBA MSc (Eng)
	Strategy and Investment Committee			
Mmuso Riba	Member	1 September 2014	To date	BSc (Math, Chem) BSc (Surveying)
	Strategy and Investment Committee			
Dr Nozi Mjoli	Member	1 September 2014	To date	BSc (Hons) MSc (Microbiology), PhD (Microbiology)
	Strategy and Investment Committee			
Dr Sandile Malinga	CEO and member	1 April 2011	To date	PhD (Physics) MBA
	Strategy and Investment Committee			

During the twelve months to 31 March 2016, the Board convened five meetings and held a strategy session in June 2015. All five meetings achieved quorums and Board member attendance is as shown in Table 3.

**Table 3: Board Members, Meetings and Attendance**

SANSA Board Member	Board meetings for the 2015/16 financial year					
	25-26 May 2015	28 July 2015	28 September 2015 Special meeting	27 October 2015	24 February 2016	25 June 2015 Strategy session
Joy-Marie Lawrence	Y	Y	Y	Y	Y	Y
Ashley Naidoo	Y	Y	Y	X	Y	X
Eugene Jansen	Y	Y	Y	Y	Y	Y
Gaborekwe Khambule	Y	Y	X	X	Y	X
Johan Prinsloo	Y	Y	Y	Y	Y	Y
Marius Rezelman	Y	Y	X	Y	Y	Y
Matsie Matooane	Y	Y	Y	Y	Y	Y
Mbali Mfeka	Y	Y	Y	Y	Y	Y
Mmuso Riba	Y	X	Y	Y	Y	Y
Dr Nozi Mjoli	Y	Y	X	Y	Y	Y
Omar Latiff †	X	Y	■	■	■	Y
Potlaki Maine	Y	Y	X	Y	Y	Y
Prof Ramesh Bharuthram	Y	Y	X	Y	X	X
Simphiwe Hamilton	Y	Y	Y	Y	Y	X
Vincent Gore	Y	X	Y	X	Y	Y
Willie van Biljon	Y	Y	Y	Y	Y	Y
Dr Sandile Malinga	Y	Y	X	Y	Y	Y

Attendance: Y – present X – apology ■ – Not a member

† Mr Omar Latiff passed away in September 2015.



## Board Committees

Three standing Board Committees support the Board in discharging its functions. The responsibilities and functions of Board Committees are set out in respective Board-approved charters.

### Audit and Risk Committee

The establishment of the Audit and Risk Committee complies with Sections 76(4)(d) and 77 of the PFMA and Section 3 of the National Treasury Regulations. As at 31 March 2016 the Committee consisted of four non-executive members.

The Audit and Risk Committee convened four ordinary meetings and two special meetings during the twelve months ended 31 March 2016.

**Table 4: Audit and Risk Committee Members, Meetings and Attendance**

Audit and Risk Committee Member	Meetings for the 2015/16 financial year					
	14 May 2015	16 July 2015	9 October 2015	14 October 2015 Special meeting	15 January 2016 Special meeting	12 February 2016
Mbali Mfeka (Chairman)	Y	Y	Y	Y	Y	Y
Johan Prinsloo	Y	Y	Y	Y	Y	Y
Omar Latiff	Y	Y	■	■	■	■
Potlaki Maine	Y	X	Y	X	Y	Y
Simphiwe Hamilton	X	Y	Y	X	X	Y

*Attendance: Y – present X – apology ■ – Not a member*

The Audit and Risk Committee provides independent oversight of the:

- effectiveness of SANSA's internal control systems and functions, including audit
- management of SANSA's risks
- adequacy, reliability and accuracy of the financial information
- compliance with governance policies, applicable laws and legislation.

## Strategy and Investment Committee

The Strategy and Investment Committee consist of five non-executive Members and SANSA's CEO and CFO as ex-officio Members. During the six months ended 31 March 2016, the Executive Director: Space Programme was also appointed to the Committee as an ex-officio member without voting rights.

The Committee assists the Board in discharging its responsibilities to, among others:

- facilitate and oversee the strategic planning process
- ensure that the Strategic Plan sets out performance priorities
- ensure relevant resourcing of SANSA's strategic initiatives
- monitor performance.

As shown in Table 5, the Strategy and Investment Committee convened four ordinary meetings and two special meetings during the twelve months ended 31 March 2016.

**Table 5: Strategy and Investment Committee Members, Meetings and Attendance**

Strategy and Investment Committee Member	Meetings for the 2015/16 financial year					
	12 May 2015	14 July 2015	19 October 2015	13 January 2016 Special meeting	10 February 2016	18 February 2016 Special meeting
Marius Rezelman (Chairman)	Y	Y	X	Y	Y	Y
Eugene Jansen	Y	X	Y	Y	Y	Y
Mmuso Riba	X	Y	X	X	X	X
Dr Nozi Mjoli	Y	Y	Y	X	Y	Y
Prof Ramesh Bharuthram	Y	Y	Y	Y	X	Y
Dr Sandile Malinga	Y	Y	Y	Y	Y	Y
Bulelwa Pono	Y	Y	Y	Y	Y	Y
Amal Khatri	■	■	■	Y	Y	Y

Attendance: Y – present    X – apology    ■ – Not a member

## Human Resources, Social and Ethics Committee

The Human Resources, Social and Ethics Committee consists of five non-executive members and the Executive Director: Corporate Services as an ex-officio member, as set out in Table 6. The Committee assists the Board with oversight of matters relating to human resources, remuneration, code of conduct and social and ethics. The Committee is responsible to, among others:

- ensure that the Human Resources strategy supports the Agency's vision, mission and associated activities
- oversee human resource-related issues, including employee benefits, succession planning, organisational design and talent management.

During the twelve months ended 31 March 2016, the Human Resources, Social and Ethics Committee convened three meetings.

**Table 6: Human Resources, Social and Ethics Committee Members, Meetings and Attendance**

Human Resources, Social and Ethics Committee Member	Meetings for the 2015/16 financial year		
	7 May 2015	30 September 2015	8 February 2016
Matsie Matookane (Chairman)	Y	Y	Y
Ashley Naidoo	Y	Y	Y
Gaborekwe Khambule	Y	X	Y
Vincent Gore	Y	Y	X
Willie van Biljon	Y	Y	Y
Zweli Ndziba	Y	Y	Y

*Attendance: Y – present X – apology*

## Board Member Remuneration

Board Member remuneration is aligned with National Treasury guidelines as set out in Note 21 of the Annual Financial Statements. The Board is categorised at level A2 and Board Members are paid to prepare for and attend meetings. Board Members are not paid a daily allowance when attending to SANSA business but per hour for the actual event. However, Board Members are reimbursed for travel costs (airfares and car hire) and incidental expenses such as parking, train fares and the use of personal vehicles (reimbursed per km as per SANSA's travel policy) and receive a monthly cell phone and data allowance in line with SANSA's cell phone and 3G policy.

Board Members who represent other government departments or institutions are not remunerated unless proof of permission to do remunerative work outside their normal official duties is submitted.

SANSA Board Members for the 2015/16 financial year



Joy-Marie Lawrence  
Board Chairman



Dr Sandile Malinga  
CEO



Gaborekwe Khambule  
Board Member



Marius Rezelman  
Board Member



Mbali Mfeka  
Board Member



Vincent Gore  
Board member



Simphiwe Hamilton  
Board Member



Ashley Naidoo  
Board Member



Dr Nozi Mjoli  
Board Member



Potlaki Maine  
Board Member



Willie van Biljon  
Board Member



Prof. Ramesh Bharuthram  
Board Member



Matsie Matooane  
Board Member



Eugene Jansen  
Board Member



Johan Prinsloo  
Board Member



Omar Latiff  
Board Member



Mmuso Riiba  
Board Member

## Senior Management

The Chief Executive Officer and the Senior Management are responsible for ensuring effective and efficient management of SANSA's operations and driving the achievement of SANSA's mandate. The management structure was designed to meet the SANSA's needs towards attaining its goals.



Dr Sandile Malinga  
CEO



Bulelwa Pono  
CFO



Zweli Ndziba  
ED: Corporate Services



Amal Khatri  
ED: Space Programme



Dr Lee-Anne McKinnell  
MD: SANSA Space Science



Raoul Hodges  
MD: SANSA Space Operations

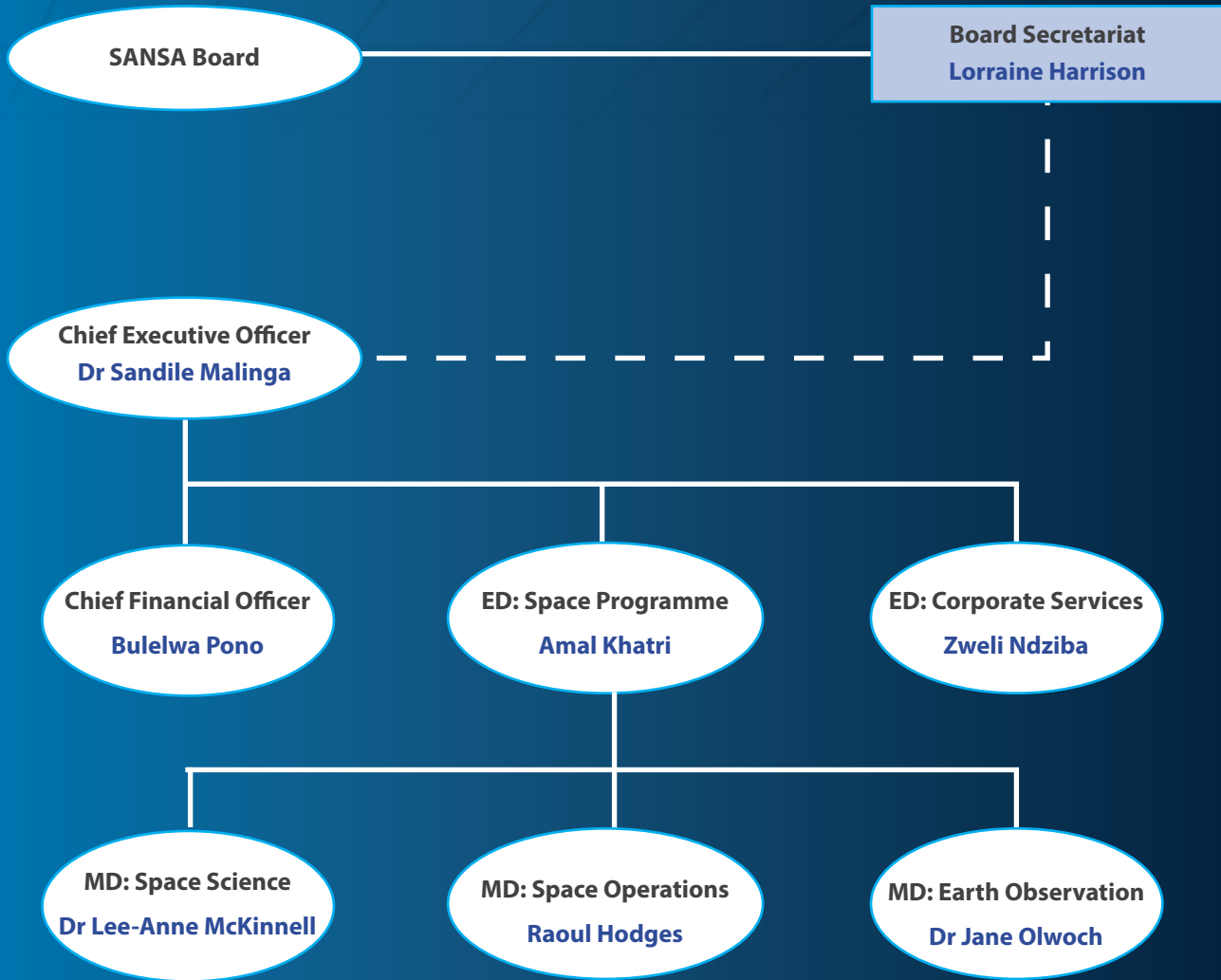


Dr Jane Olwoch  
MD: SANSA Earth Observation



Lorraine Harrison  
Board Secretary

Senior Management Organogram.



# REPORT BY THE AUDIT AND RISK COMMITTEE

The Committee is pleased to present its report for the financial year ended 31 March 2016.

The Audit and Risk Committee comprises of the members listed on page 65 of the Annual Report and is required to meet at least four times per annum, as per its approved terms of reference. During the period under review, the Committee met six times. The meetings attendance of Committee Members is disclosed on page 65 of this report. The Committee also conducted a self-assessment during this period.

## Responsibilities of the Audit and Risk Committee

The Committee adopted appropriate formal terms of reference in its charter, which are in line with the requirements of Section 51(1) (a) of the Public Finance Management Act (Act 1 of 1999) as well as with its responsibilities as set out in Treasury Regulations 3.1.13 and 27.1. The Committee adopted appropriate formal terms of reference as its Audit and Risk Committee Charter, regulated its affairs in compliance with the charter and discharged its responsibilities contained therein.

## The Effectiveness of Internal Controls

The Committee is satisfied that an adequate system of internal controls is in place to mitigate risks at an acceptable level and that these controls were effective during the financial year under review. Internal Audit provided the Audit and Risk Committee with the assurance

that the internal controls were appropriate and effective. The assurance is reasonable but not absolute.

The Committee's review of the Agency's internal audit findings, which were based on conducted risk assessments, revealed certain weaknesses. These were raised with SANSA.

- During the 2015/16 financial year, the internal audit unit successfully conducted internal audit assignments based on a "risk-based audit approach", which is outlined in the approved internal audit plan.
- The SANSA internal audit unit has adopted a co-sourced model whereby the organisation makes use of an internal audit service provider as well as an in-house audit to meet the mandate and responsibilities of the unit.

## Risk Management

The Committee is satisfied with SANSA's ongoing risk management process of identifying, assessing, managing and monitoring all known forms of significant risks across all operations. This process was in place for the year under review and up to the approval of the 2015/16 Annual Financial Statements.

SANSA's legal mandate is to develop and implement effective and efficient risk management and internal control system in accordance with Treasury Regulation 27.2.1, which requires SANSA to conduct risk assessments regularly and develop a risk management strategy that includes a fraud prevention plan and the management capacity required to manage the identified risks.

SANSA strives to be a sustainable and performance-driven entity and, as such, has adopted an enterprise-wide risk management approach to manage all its business risks. Risk

management methodologies are applied in strategy setting, planning, projects, decision-making and all other business processes. The aim is to ensure that SANSA's strategic objectives are met by the Agency and its brand protected effectively against reputational and financial damage.

SANSA keeps the Audit and Risk Committee abreast of developments through scheduled meetings in accordance with the Board-approved year plan. Risk assessment is conducted annually at a strategic level and aligned with the Agency's strategic planning process. The risks are captured and documented in a risk register and monitored on an ongoing basis as directed in the risk mitigation strategies.

### Internal Audit

The Committee evaluated the internal control environment and determined that SANSA's internal controls are sufficiently effective to mitigate risks (based on the information provided). In line with the PFMA, the internal audit coverage plan was informed by the risk management process. The head of Internal Audit reports directly to the Audit and Risk Chairperson and administratively to the Chief Executive Officer.

### In-year Management and Monthly/Quarterly Reporting

The public entity has submitted monthly and quarterly reports to the Executive Authority.

### Evaluation of Annual Financial Statements

In terms of SANSA's Annual Financial Statements, the Committee has:

- Reviewed and discussed the audited annual financial

statements, to be included in the annual report, with the external auditors.

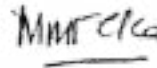
- Reviewed the Agency's management letter and management's response to it.
- Reviewed changes in accounting policies and practices.
- Considered the applicability of the going concern assumption.
- Reviewed the Agency's compliance with legal and regulatory provisions.
- Reviewed significant adjustments resulting from the audit.

The Committee concurs with, and accepts, the external auditor's report included in the 2015/16 Annual Financial Statements.

### Auditor's Report

We have reviewed the public entity's implementation plan for audit issues raised in the prior year and we are satisfied that the matters have been adequately resolved except for minor audit issues which could not be resolved.

The Audit and Risk Committee concurs and accepts the conclusions of the external auditor on the Annual Financial Statements and is of the opinion that the Audited Annual Financial Statements be accepted and read together with the report of the auditor.



**Ms Mbali Mfeka**  
**Chairperson**  
**Audit and Risk Committee**



## Human Capital Management

### Management Development and Training Programme (MDTP)

SANSA's MDTP started in January 2016 as a structured programme with a formal qualification (Postgraduate Diploma in Business Management). The MDTP aims to increase the Agency's managerial capacity by providing participants with the management and leadership skills and competencies that are required at middle management level. During the past year, 16 participants enrolled on the programme, comprising seven females and nine males.

### Human Capital Strategy

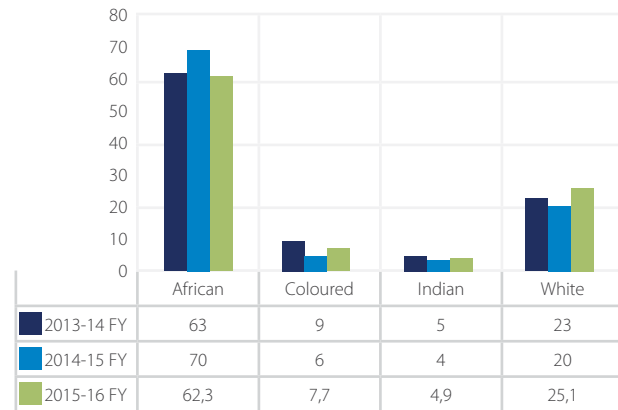
SANSA's newly developed Board-approved Human Capital Strategy (2016-2020) is a next generation strategic plan that builds on its 2012-2015 Human Capital Strategic Plan.

The strategy is aligned with the goals and objectives of SANSA's 2015-2020 Strategic Plan to respond to internal and external drivers. Key internal drivers include workforce planning; improved internal processes and practices; and responding to SANSA's strategic priorities, including organisational alignment challenges. Key external drivers include current and anticipated future funding constraints; national human capacity requirements; and competitiveness and space industry leadership.

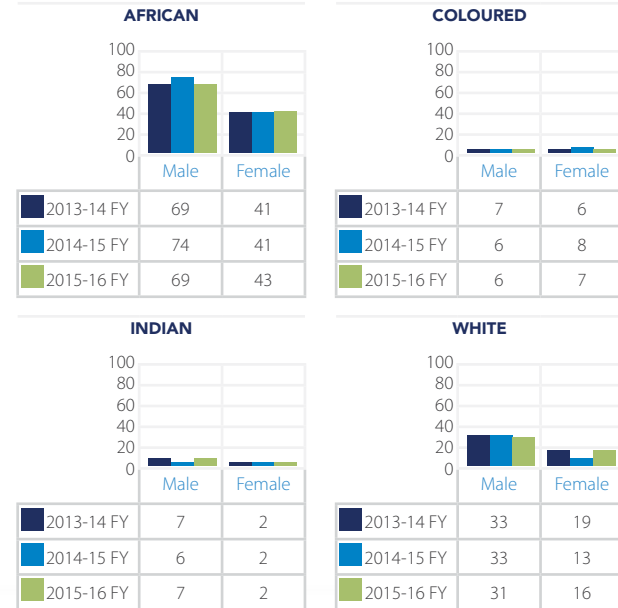
Detailed implementation plans will be developed and implemented to give effect to the strategy in the period going forward.

## Human Capital Profiles

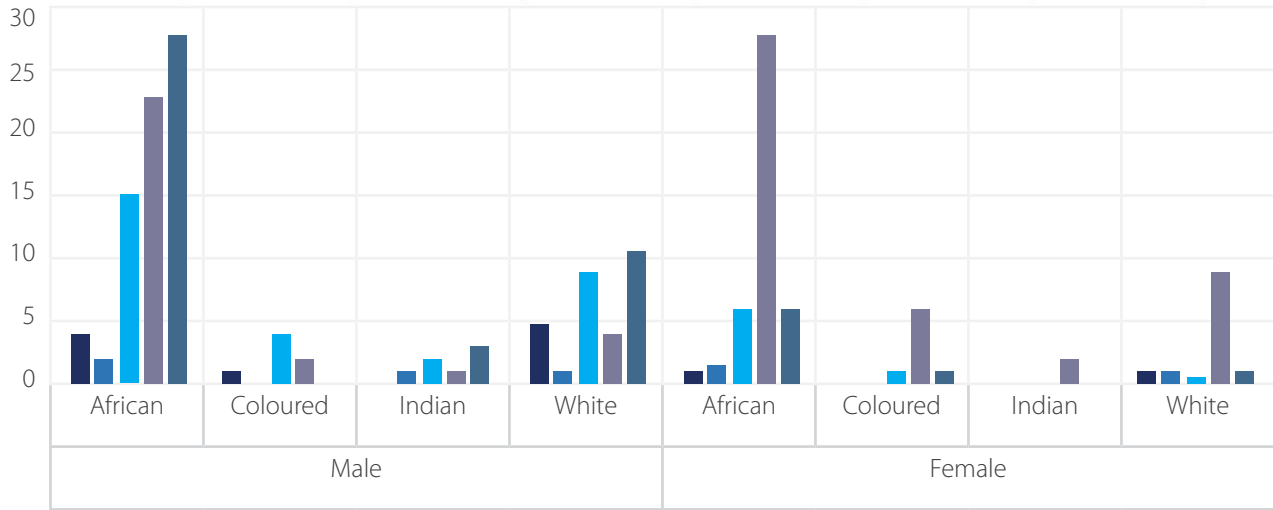
### Overall SANSA Employment Equity Profile



### Employment Equity by Race and Gender

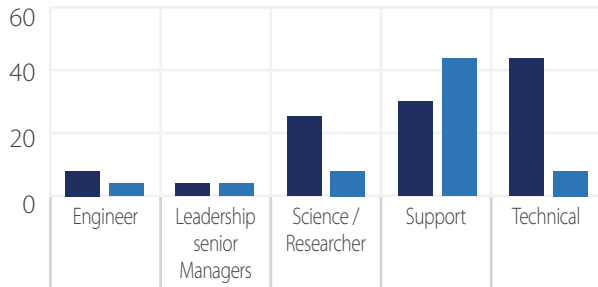


### Workforce profile by race and job category



- Engineer
- Leadership Senior Managers
- Science Researcher
- Researcher
- Technical

### Workforce profile by gender and job category



- Male
- Female

**Table 7: Total number of employees (including employees with disabilities) by occupational category**

Indicator description	Males				Females				Foreigners		T
	A	C	I	W	A	C	I	W	M	F	
Top management	2	0	1	0	1	0	0	0	0	0	4
Senior management	0	0	0	1	1	0	0	2	0	0	4
Professionally qualified and experienced specialists and mid-management	15	0	3	14	10	1	2	5	1	0	51
Skilled technical and academically- qualified workers, supervisors, junior management, foremen and superintendents	38	4	3	9	20	3	0	7	0	0	84
Semi-skilled and discretionary decision-making	7	2	0	0	5	2	0	0	0	0	16
Unskilled and defined decision-making	1	0	0	0	0	0	0	0	0	0	1
<b>TOTAL PERMANENT</b>	<b>63</b>	<b>6</b>	<b>7</b>	<b>24</b>	<b>37</b>	<b>6</b>	<b>2</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>160</b>
<b>TEMPORARY/ CONTRACT EMPLOYEES</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>23</b>
<b>GRAND TOTAL</b>	<b>71</b>	<b>6</b>	<b>7</b>	<b>29</b>	<b>43</b>	<b>8</b>	<b>2</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>183</b>
<b>DISABLED EMPLOYEES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>

A = African; C = Coloured; I = Indian; W = White; M = Male; F = Female; T = Total

### **Combined Assurance: Internal Audit, Enterprise Risk Management, Performance Management and Safety, Health, Environment and Quality (SHEQ) Management**

The King Report on Corporate Governance in South Africa, 2009 (King III) recommends a combined assurance model to create a coordinated approach to all assurance activities (overseen by the Audit and Risk Committee). The objectives of SANSA's Combined Assurance Plan, based on the risk analysis of the Agency, are mainly to:

- identify and specify the sources of assurance over the institution's risks
- provide the Audit and Risk Committee, Board and Management with a framework of the assurance parties
- link risk management activities with assurance activities to also assist the Board/CEO to review the effectiveness of the risk management system
- provide a basis for identifying any areas of potential assurance gaps.

The Combined Assurance Plan highlights relevant high-risk areas and provides the assurance that management, external audit, internal audit and other consultants or service providers require to appraise the Executive Authority of the risk management efforts undertaken to manage the risks at an acceptable level.

## SANSA's combined assurance model



SANSA's combined assurance model is depicted in Figure 13. The corresponding roles of functions and lines of defence are detailed below.

- **1<sup>st</sup> Line of Defence** - Management-embedded systems and processes support SANSA's business operations to entrench the culture and a continuous commitment to the value system.
- **2<sup>nd</sup> Line of Defence** - Business Unit Management and Process Owners are accountable primarily for identifying, prioritising, sourcing, managing and monitoring risks and implement and maintain effective control procedures on a day-to-day basis.
- **3<sup>rd</sup> Line of Defence** - These functions oversee specific areas, determine appropriate frameworks and ensure effective and consistent implementation throughout the Agency.
- **4<sup>th</sup> Line of Defence** - Independent Assurance providers offer assurance by systematically analysing and evaluating business processes to ensure effective operations and identify improvement areas for management implementation.
- **5<sup>th</sup> Line of Defence** - Ensure an institution-wide consistency in SANSA strategies and operations and serves as the focal point of corporate governance.

## Key Activities and Impact

### Enterprise Risk Management (ERM)

Enterprise Risk Management (ERM) is now firmly embedded and applied across the organisation in line with the Board-approved ERM Policy and Framework. The current status of the strategic and operational risk registers, which are reviewed periodically, is as follows:

The residual exposure of the top 10 key risks indicates that 60% of risk items have satisfactory to good control effectiveness levels, while up to 40% (or four) of the risk items have unsatisfactory (two) or weak (two) risk control effectiveness. These matters relate to inadequate funding for current business activities within SANSA (unsatisfactory); the potential of failing to achieve the objectives of the space programme division (unsatisfactory); ERP system inadequacies (weak); and addressing organisational change management challenges (weak).

**Table 8: Changes in residual exposure of the identified key risks**

Risk	Quarter 1 Residual risk	Quarter 2 Residual risk	Quarter 3 Residual risk	Quarter 4 Residual risk	Movement (changes)
Insufficient funding to meet SANSA's objectives	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory	↔
Inability to deliver against the objectives of the Space Programme's Satellite Programme	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory	↔
Non-compliance with PFMA and Treasury regulations	Very Good	Good	Good	Good	↔
Current inadequate ERP system	Weak	Weak	Weak	Weak	↔
Organisational change management challenges	Weak	Weak	Weak	Weak	↔
Shortage of human resources	Satisfactory	Satisfactory	Satisfactory	Satisfactory	↔
Lack of business continuity (disaster recovery plan)	Good	Good	Good	Good	↔
Inadequate institutional performance management	Weak	Satisfactory	Satisfactory	Satisfactory	↔
Infrastructure failure	Weak	Weak	Good	Good	↔
Failure to provide relevant products and services	Satisfactory	Satisfactory	Satisfactory	Satisfactory	↔

During the past financial year, SANSA implemented the necessary risk management instruments to address fraud and corruption, rolled out fraud risk awareness training for existing employees and included the training into the induction programme for new employees.

The Internal Social and Ethics Committee continues to monitor and address the social and ethics issues within the organisation and provides feedback to senior management and the Human Resource, Social and Ethics Committee of the Board.

## Safety, Health, Environment and Quality (SHEQ)

The implementation of the planned SHEQ management activities during the review period identified and mitigated SHEQ risks effectively and ensured that SANSA continues to comply with SHEQ training and certification.

### Safety and health

The South African Bureau of Standards (SABS) audited the SANSA Space Operations directorate at Hartebeesthoek for compliance with the OHSAS 18001 and ISO 14001 standards and identified 11 minor non-conformance areas that have been rectified. The SANSA Disabling Injury Frequency Rate (DIFR) remains at 0.

### Environment

SANSA is committed to minimising its impact on the environment and maximise its responsible use of natural resources. Activities in this regard included controlled waste disposal and recycling, as well as ongoing communication and awareness creation about managing our energy resources, such as electricity and water consumption.

### Quality

The focus of SANSA's quality activities is to:

- establish and maintain a certified Quality Management System and SHE Management System according to ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007

- communicate quality procedures, best practices and knowledge throughout the Agency.

Activities included regular updating of SANSA's Quality Management System (QMS) with newly approved policies, procedures, business forms and processes.

## Stakeholder Management

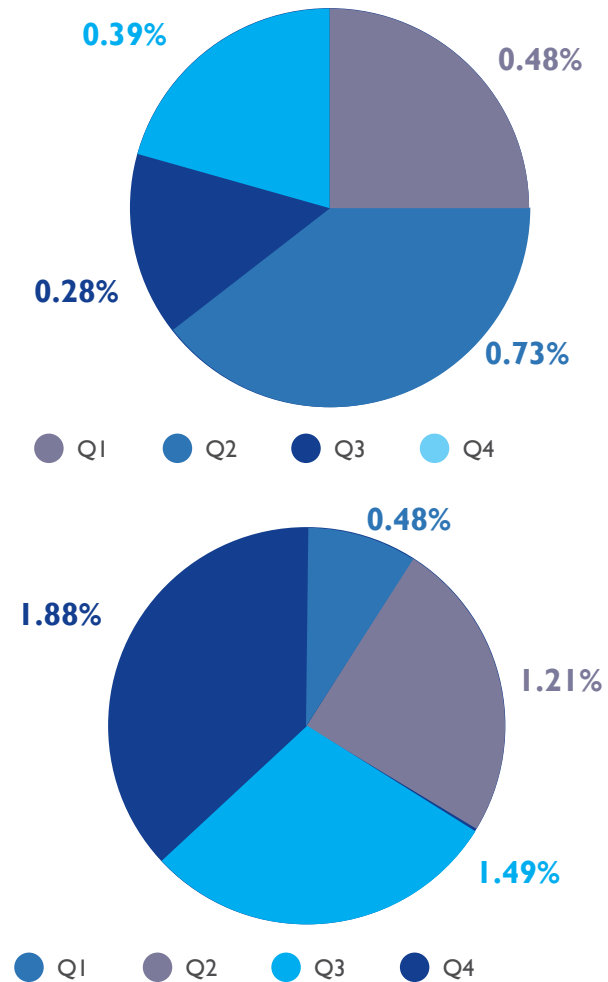
During the past financial year, results from a stakeholder awareness survey within government, industry, academia, science councils, the media and other groups indicated a positive awareness (93%) about SANSA programmes. The respondents were from government (29%), industry (26%), academia (17%) and science councils (17%), the media (2%) and other groups (10%). Respondents confirmed their occasional (55%) or regular (36%) contact with SANSA and good (48%) or excellent (36%) engagement with the Agency. The majority (99%) of respondents want more information about programme developments (64%), project proposals (64%), news (62%) and research developments (60%).

Some of SANSA's active partnerships deliver monetary benefit through monetary transfers and in-kind benefits. The current target is to generate 5% income through partnerships to contribute to a projected revenue of R232 million. During the reporting period, SANSA generated an estimated R3.5 million (1.49%) from partnerships with a quarterly return of 0.48% (Q1), 0.73% (Q2), 0.28% (Q3) and 0.39% (Q4).

SANSA needs a significant amount of resources to service its partnerships and leverage matching funding.



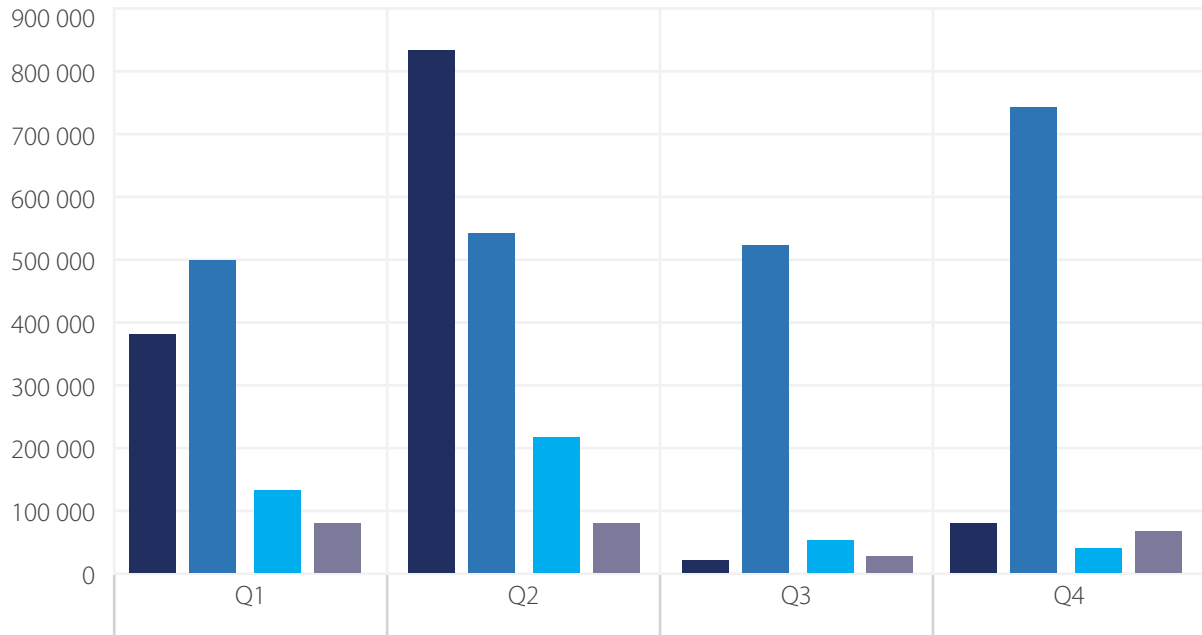
### Quarterly percentage and year-to-date monetary return from investing in partnerships





This stakeholder benefit consists of project funding, personnel benefits, training and travel and subsistence funding. Project funding and personnel benefits are the two dominant contributions as shown below.

### Contributions from global partnerships for, inter alia, project funding and personnel benefits



● Project Funding ● Personnel Benefit ● Training ● Subsistence & Travelling

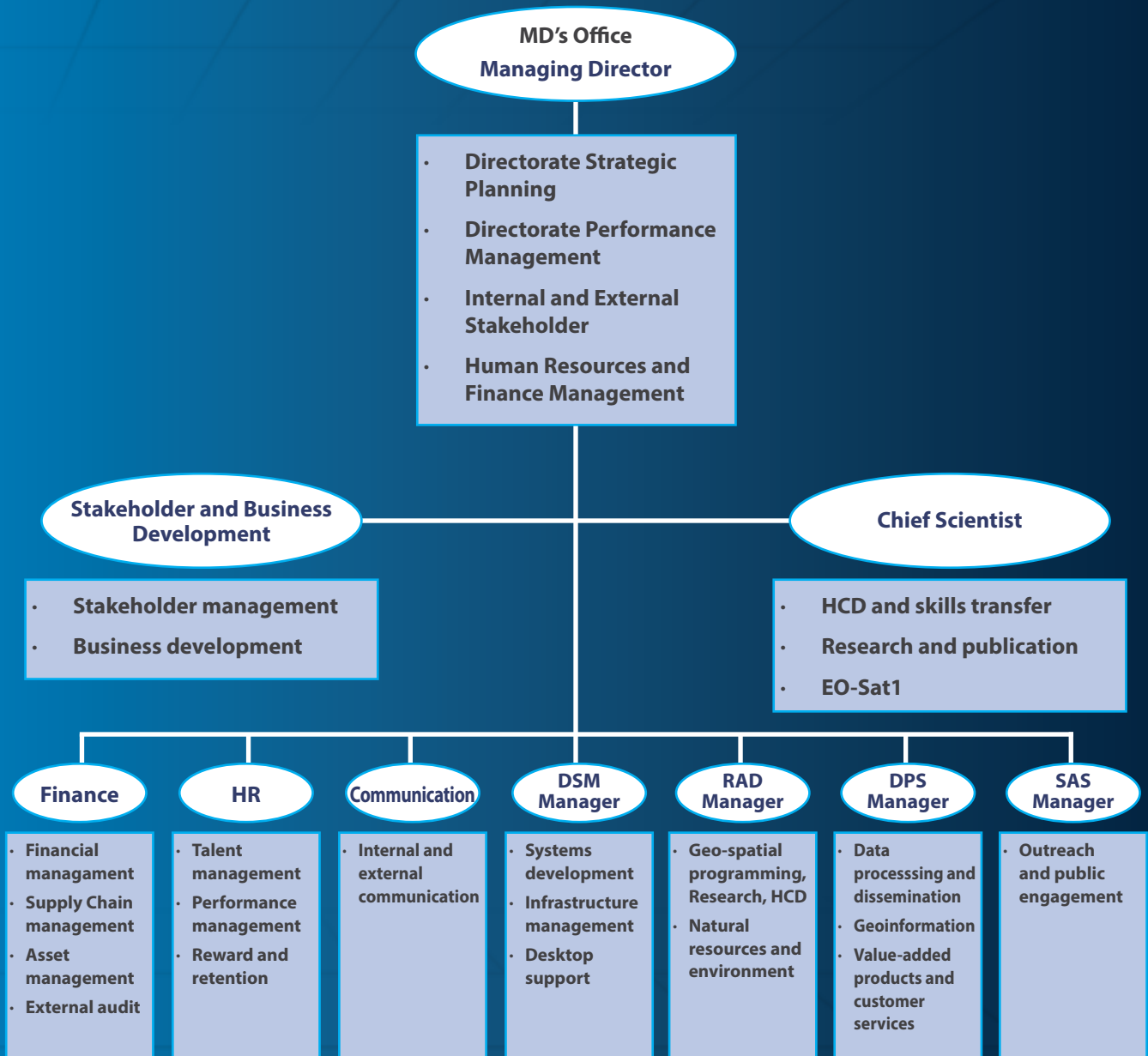
Some partnerships with local stakeholders are not formalised through contractual agreements or MoUs, however they are not less effective. SANSA will pursue contractual agreements for these partnerships going forward.

# PROGRAMME 2: EARTH OBSERVATION (EO)

## Highlights

- **Geospatial data, information and decision tools**
- **7 974 images acquired and 47 485 images distributed**
- **20 fires investigated and reports produced**
- **R5 million research fund acquired**
- **4 national value-added products developed in human settlement, water and disaster and vegetation management**
- **7 short courses delivered to 135 stakeholders**
- **50 continental and local participants in SANSA training workshops**
- **7 653 youths engaged in 6 provinces**
- **3 local municipal workshops to promote satellite data**
- **11 Fundisa disks distributed to Universities in South Africa**
- **31 Fundisa disk (School Edition) distributed to 31 schools**
- **29 micro and small companies engaged as part of industry development**

## Programme structure and functional scope



## Functional Scope

SANSA acquires, archives, processes and distributes imagery and products to government entities, R&D institutions and higher education institutions (HEIs). Supplying government departments with cost-effective data and information supports national imperatives, while stakeholders such as research councils and academic institutions can use the multi-government licensed imagery at no additional cost. SANSA also provides students with geospatial resources through its Fundisa Disk Programme (FDP) to promote the use of spatial information at tertiary level.

Earth observation, as a source for geo-information, contributes to the management, sustained utilisation, preservation and understanding of natural resources; improved health, safety and security; forecasting and monitoring to manage and mitigate disasters; increased R&D data stock and value-added data products and information; and the provision of decision-making, policy-making and planning instruments for public and private sector users. Collectively, these contributions add significant value to a vast array of socio-economic benefits and improved livelihoods.

The impact of Earth observation (EO) lies in providing:

- essential EO services for socio-economic benefit in managing our water, environmental and other resources; disasters; health, safety and security; and environmental change, including climate change management
- data and value-added remote sensing services for research and development in EO applications

- national geospatial information to aid decision-making in support of key government priorities
- human capital development and science advancement in geo-informatics, image and data processing and remote sensing.

The core functions of the EO programme include:

- contributing to the implementation of the South African Earth Observation Strategy (SAEOS)
- maintaining a long-term archive of satellite data for national benefit that is essential for change detection to better understand environmental change in time and space
- continuous data acquisition from South African and global EO satellites
- coordinated procurement of satellite data and distribution of data/images to government departments, national R&D institutions and HEIs
- processing and production of value-added satellite imagery and information products and services for various geo-information applications
- continuous improvement of in-house processing chains and reference datasets to higher geometrical accuracies, using improved digital surface and elevation models
- development and maintenance of easily accessible and efficient distribution channels of value-added image products through catalogue systems
- development of human capital to advance the above and meet the skills need of the country
- advancement of science amongst the youth and public

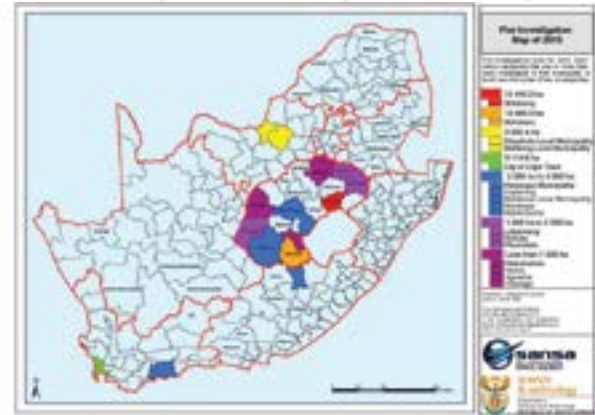
- development and maintenance of international partnerships for the advancement of the objectives indicated above
- contribution to the development of innovative EO sensors
- development of EO applications as per stakeholder needs
- participation in and contribution to regional and international Earth observation fora such as AfriGEOSS, Group on Earth Observation (GEO) and the Committee on Earth Observation Satellites (CEOS).

## Key Activities and Impact

### Activity 1 - Earth Observation Data Access and Infrastructure

SANSA distributed 47 485 images during the reporting period, including those in response to ad hoc requests from state entities, municipalities, research and academic institutions and commercial entities; the Fundisa Disks distributed to universities; and the completion of the SPOT-6 and SPOT-7 2015 National Mosaic.

The completion of several fire reports assisted dispute resolution in fire investigations since remote sensing techniques can determine the start and spread of fires and calculate the destroyed area. SANSA uses a combination of Landsat, SPOT and MODIS satellite images to provide an accurate assessment for a fire investigation.



**Spatial distribution of the fires investigated during the first half of the 2015/16 financial year**

### Activity 2 - Infrastructure and Systems

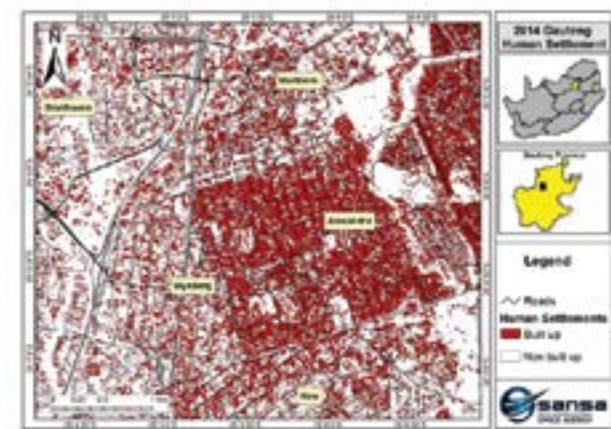
The increase of our data storage capacity to 100TB during the past year enabled the EO team to complete more data projects and respond to more data requests from stakeholders.

SANSA increased its data delivery capacity and developed a data verification procedure to keep track of data received directly from satellites. In addition to imagery from the SPOT, Landsat and MODIS satellites, SANSA receives data daily from the China-Brazil Earth Resources Satellite (CBERS-4).

**Impact: Improved processing with the new technology; increased delivery of projects and products due to increased storage capacity; external storage (DMZ) environment supported data delivery to customers; reduced data delivery time and increased delivery size.**

### Activity 3 - National Human Settlement Layer

The two full national human settlement layers (2012 and 2014) completed during the past year show all built-up areas in the country. The 2014 product updates the 2012 layer that was used widely by the Department of Human Settlements, Housing Development Agency, Statistics South Africa, Department of Environmental Affairs and the Municipal Demarcation Board. We are also extending the user-base for the human settlements layer to include the Provincial Spatial Planning Departments and municipalities.



#### **The 2014 Gauteng Human Settlements Layer**

We completed a policy paper on how satellite-based, remote sensing technologies can support urban spatial planning and inform human settlements development policies, and created a web mapping service application to showcase SANSA's value-added products online. The available layers include water bodies, flood inundation, normalised difference vegetation index (NDVI), human settlements, forests and informal settlement maps. User

registration and a VAP ordering system will be completed in the year ahead.

During the past year, Rand Water contracted SANSA to supply satellite-based remote sensing services to monitor servitude encroachment. The six-month contract demonstrated the value of EO in integrated water management.

We also used SPOT-6 and SPOT-7 imagery and current human settlement detection methodology to identify building structures along pipelines.

*Impact: Census/survey and planning financial and human resources; demarcating enumerator areas (EAs) and assessing human settlement growth within an EA; mapping densification and dwelling frames, as well as building types and the orientation of field work/navigation; and identifying new developments and servitudes encroached by human settlements.*

## Activity 4 – Global Partnerships

SANSA continues to build effective global partnerships within relevant institutions and bodies. The Agency's chairmanship of the CEOS working group on Capacity Building and Data Democracy was endorsed at the CEOS plenary that took place in Kyoto, Japan. This endorsement came at a crucial time when data access and distribution became the key responsibility of many satellite operators and brought about a realisation of the significant gap between developed and developing countries in terms of their capacity to process satellite Earth observation data. Along with the Indian Space Research Organisation (ISRO), currently the CEOS Vice-Chair, SANSA has an obligation to champion the capacity initiatives of CEOS, especially those in the African continent.

As a participant in the first Monitoring for Environment and Security in Africa (MESA) and TIGER regional programmes, SANSA hosts workshops to build capacity in the African continent. MESA, an EU-funded, continental programme that is coordinated by the African Union, aims to improve human well-being on the African continent and SANSA actively contributes to ecosystem integrity through assistance with information management and access to environmental information from Earth observation applications.



***MESA workshop participants at DST***



***SANSA and UKSA representatives***

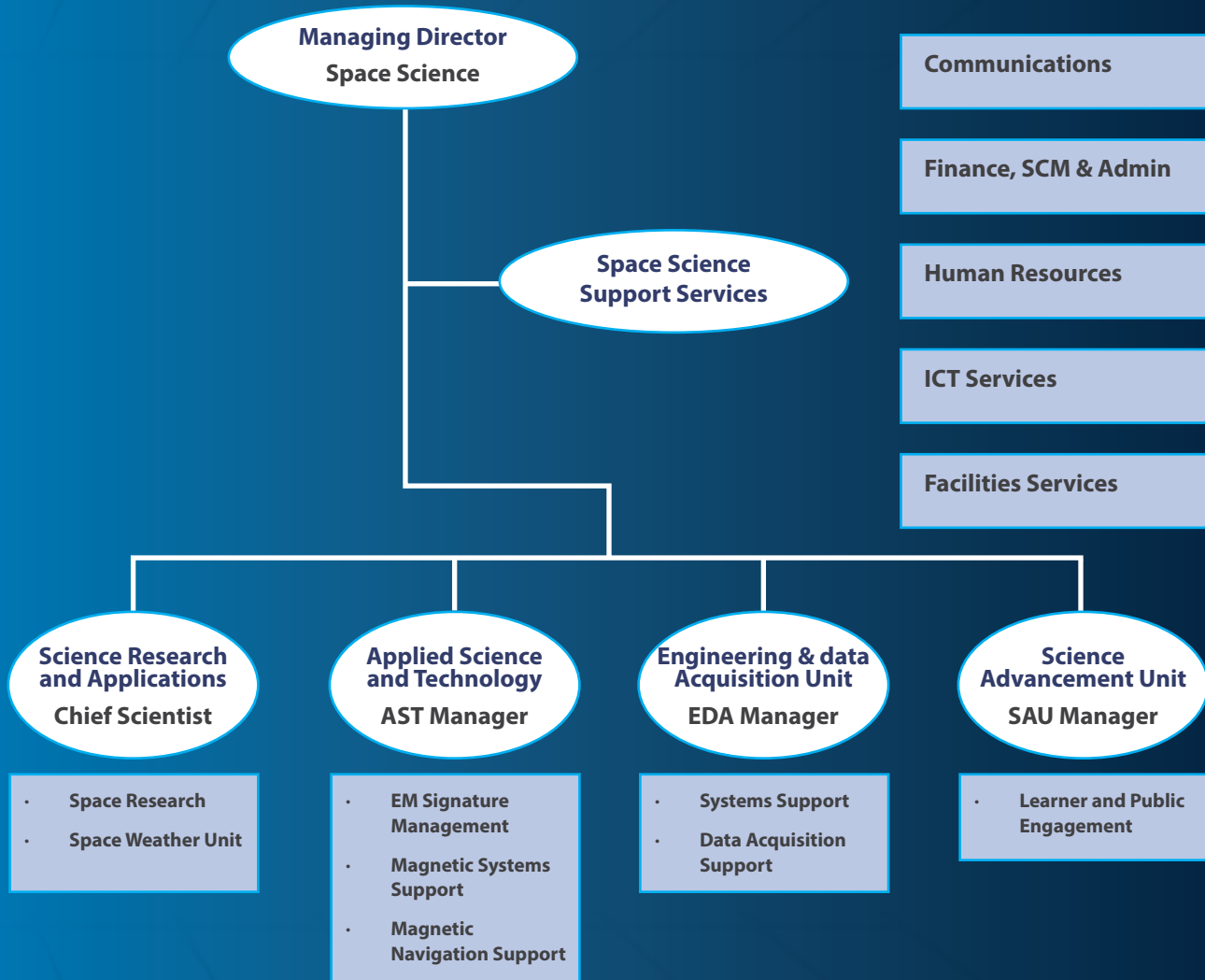
# PROGRAMME 3: SPACE SCIENCE (SS)

## Highlights

- **New knowledge on the near Earth-space environment**
- **26 papers published in peer review journals**
- **2 book contributions**
- **R4.5 million research funding**
- **1 555 research productivity score**
- **19 short courses presented to external participants**
- **45 international participants at EISCAT Symposium**
- **6 274 learners engaged in STEM outreach activities**



## Programme Structure and Functional Scope



## Functional Scope

SANSA's Space Science Programme leads multi-disciplinary space science research and applications. Key functions include fundamental and applied space science research, the support of space-facilitated science through data acquisition, coordination and administration of scientific data and provision of space weather and magnetic technology products and services on a commercial and private basis.

Through this programme, SANSA contributes to the worldwide network of magnetic observatories that monitor the Earth's magnetic field and participates in global scientific projects. The programme also provides postgraduate student training, science advancement, public engagement and learner and educator support for STEM subjects.

The Space Science Programme consists of three main components:

- Space Weather, Geo-space Data Services and Space research
  - Functional space weather centre
  - Space weather services
  - Geomagnetic services
  - Space environment research
- Space Research Instrumentation and Data Management
  - Geophysical instrumentation support
  - Data collection and processing
  - Data archiving and distribution

- Applied Science and Technology Services
  - Magnetic navigation ground support
  - Magnetic system integration
  - Electromagnetic signature management

## Key Activities and Impact

### Activity 1 – Space Science Research

#### **Understanding our Space Environment**

Fundamental and applied space science research at SANSA is primarily aimed at growing the knowledge economy and providing the foundation for innovative applications that contribute to achieving national priorities. New insights from SANSA researchers into the theoretical modelling of near-Earth space plasmas, which were published in high-impact factor journals to international recognition during the 2015/16 financial year, will expand our knowledge of the space environment.

SANSA's ongoing research endeavours during the past year have contributed to new knowledge that will, inter alia, help to estimate a satellite's lifetime; result in ground-breaking global studies using the entire SuperDARN radar network; simplify future research in nonlinear plasma wave solutions; model our space environment to expand our knowledge in space science and technology; improve the accuracy and applications of space weather predictions; and assist in preventing widespread loss of power and communication and navigation systems.

#### **Geomagnetically Induced Current (GIC) Research**

SANSA's researchers participated in the NASA Living with a Star (LWS) project on GIC research and analysed a GIC

proxy with South African magnetometer data. The expertise of our researchers and their access to data from within a geographically advantageous region make them sought-after participants in research projects and provides SANSA with the ability to develop applications that benefit the nation.

### **Ionospheric Research**

The outputs from SANSA's ionospheric research projects during the past year will, inter alia, help to improve space weather forecasting over the African region; contribute to the understanding of adverse space weather conditions that can impact communications systems; provide the global research community with a new source of data that will improve space weather applications; provide data on which many South African maps are determined; enhance the general understanding of the dynamics of the space environment; and plan for extreme space weather events that could impact the economy and national security.

### **Research Productivity**

SANSA researchers published a book entitled *"A southern African secular variation model derived from satellite data"* and contributed a chapter to a book entitled *"The History of Geophysics in Southern Africa"*. The latter details the important role that the facility at Hermanus has played throughout the 80-year history of South Africa's geophysics community.

SANSA's applications for NRF ratings for four researchers (one renewal and three new applications) in 2015 achieved a 100% success rate. To date, seven SANSA researchers are NRF-rated, which entrenches SANSA's positioning within the international space science community.

SANSA measures its research impact through a research productivity score based on high-impact internationally reviewed journal papers, contributions to expert textbooks, research ratings of individual researchers and the number of research student graduates. During the 2015/16 financial year, the Space Science programme contributed 1 555 points towards SANSA's research productivity KPI.

### **Activity 2 – Space weather applications**

During the review period, space weather applications included providing a client with a unique set of space weather knowledge, expertise, products and services through the SANSA Space Weather Centre Regional Warning Centre for Africa. Services to the SANDF included adverse space weather notifications and vital information to assist in optimising communication with troops and military ground personnel, as well as customised training courses.

SANSA assisted the Maritime Control Centre at the Institute for Maritime Technology (IMT) in Simon's Town with a real-time space weather information display to set communication paths for vessels at sea and trained IMT staff members and Navy officers to use the display.

In response to a recommendation by the International Civil Aviation Organisation (ICAO) to provide all passenger aircraft flight plans with space weather forecasts by 2017, SANSA developed partnerships and will continue to do so to achieve this goal. The impact will be seen in South Africa's preparedness to implement the ICAO recommendations in 2017 and a heightened awareness of the impact of space weather within the aviation sector.

### Activity 3 – Geophysical research infrastructure platform

The commissioned SANREN broadband Ethernet fibre connection to the SANSA Hermanus facility is operational. Infrastructure to support the installation was installed during 2015 and the facility moved onto the new connection in March 2016, after rigorous stability and reliability testing. The impact of this new connection on operations is significant as SANSA no longer requires the expensive wireless connection used during the past three years. The additional line speed will enhance the facility's performance and big data management.

The 2015/16 Antarctica takeover team and 2015 overwintering engineers arrived back safely in South Africa after another successful expedition. The takeover team completed routine maintenance to all SANSA's Antarctic-based research equipment and major repairs to the main antenna array of the SuperDARN Radar to restore optimal performance. The 2015 overwintering period was extremely successful with good quality data captured by all the instrumentation throughout the year.

The South African National Geophysical Data and Instrumentation Management System (SANDIMS) is a SANSA priority project. SANSA currently maintains and operates numerous instruments around Southern Africa, Antarctica and the Southern Ocean Islands. The instruments which form a geophysical network that is internationally recognised for measuring the space environment from the ground. The network data is used for a wide variety of applications, including space-derived applications that contribute to the defence, communications and aviation sectors.

SANSA completed the installation of a state-of-the-art

Optical Space Research (OSR) laboratory in Sutherland on the site of the South African Astronomical Observatory (SAAO). The laboratory will be used for a new research field within South Africa in optical space measurements to gain insights into the dynamics of the Earth's middle and upper atmosphere.

The OSR laboratory will host joint projects with international partners, including the DLR and universities in the USA such as Boston, Clemson and Utah State Universities. The DLR will use the laboratory to set up a Space Debris Tracking station and SANSA foresees opportunities for researchers, engineers and students to become more involved in space debris tracking techniques.

### Activity 4 – Magnetic navigation ground support

SANSA researchers have completed the first phase of a magnetic signature inversion project for marine vessels for the maritime industry. Better knowledge about magnetic signatures will assist the navy to manage and minimise the magnetic fields of its own vessels and identify the magnetic signatures of unknown vessels.

SANSA provided the South African Air Force (SAAF) with 15 compass swing courses that are accredited by the Civil Aviation Authority (CAA) and part of the SANSA/SAAF contract to provide magnetic technology-related services. Over the past two years, the need for these courses increased due to the significant benefit derived from personnel trained in conducting a compass swing procedure effectively. The training of military personnel in South Africa also ensure that the knowledge and skills are developed for the security of the nation.

SANSA conducts magnetic tests at its premises in Hermanus according to the Radio Technical Commission for Aeronautics (RTCA) DO-160, Section 15 (USA) and 3G.100: Part 2: Section 2 (UK) international standards to determine the magnetic effect of an aircraft's avionics or other equipment on its magnetic navigation sensors.

Recent information indicates that the Agency is currently the only organisation in Africa to do so. Since the Hermanus facility could not accommodate heavy, large and/or bulky equipment, SANSA acquired premises at Houwteq in Grabouw and tested several large aircraft systems during the past year. The new facility added an important capability to SANSA's portfolio of services to help stakeholders maintain product standards.



***SANSA provides magnetic testing according to international standards***

### Activity 5 – Global Partnerships

Over 120 international and African delegates attended four international conferences in Hermanus. These included an African Space Science Research workshop with participants from 11 different African countries and the biennial European Incoherent Scatter Radar (EISCAT) symposium and 42nd annual Atmospheric Studies by Optical Methods meeting, both held for the first time in the Southern Hemisphere.

SANSA participated in three of the five work packages of the UK Space Agency International Partnerships in Space Project entitled "Space Weather the Economic Case". Under this partnership, three exchange visits to the UK took place with a focus on forecasting, predicting and verifying space weather events, assessing the socio-economic benefits of space weather forecasting and improving partnerships and knowledge exchange opportunities between space institutes in the USA, UK and South Africa.

SANSA also successfully partnered with two UK organisations under the Royal Society's Newton Fund Programme and hosted the HESA/IBSA Workshop on Mathematical Modelling of Fluctuations in Space Plasmas, which included participants from the Instituto Nacional de Pesquisas Espaciais (INPE) in Brazil, the Indian Institute of Geomagnetism in Mumbai, the University of the Western Cape (UWC) and the Council for Scientific and Industrial Research (CSIR).

Global partnerships benefit both SANSA and the space research community in South Africa by creating unique opportunities for new science discoveries, essential networks and discipline-specific experiences, as well

as driving innovation and technology applications that benefit society.

#### Activity 6 – Student Development, Science Advancement and Public Engagement

SANSA reached over 60 000 learners during five national science festivals, including Science Tube in Thohoyandou, SA Agulhas II exhibition at Cape Town Harbour, Touwsriver Science Expo, Science Tube in Kimberley and SciFest Africa in Grahamstown. The engagements included the SANSA Aspire to Inspire programme, which exposes learners to different STEM career opportunities. Learners shared possible career choices through feedback surveys. These engagements highlighted the importance of the interface between science and society as part of the DST Public Engagement Framework.



**Young learners at the SANSA stand during SciFest Africa**

SANSA hosted a successful World Space Week and National Science Week through its space science programme. Activities included public engagements such as the Space Agency Open Day, local community expos, public outreach activities and rural school visits that reached over 6 000 learners.

SANSA's annual TUTOR programme assists high school learners with mathematics and physical science. Grade 11 and 12 learners from surrounding high schools participated in the intense programme with curriculum support from SANSA researchers and postgraduate students. The interaction is part of SANSA's social responsibility and enables learners to significantly improve their math and science results.

SANSA also provided internships and volunteer opportunities to four young unemployed graduates under the NRF/DST Internship and SAASTA (South African Agency for Science and Technology Advancement) Volunteers programme, as well as two vacation student placements during the 2015/16 summer vacation period. These opportunities allow young students to obtain valuable working skills and improve their chances of employment after graduation.

SANSA continued to develop closer relationships with local and international stakeholders through its series of public lectures in the Western Cape. During the review period, just under 500 members of the public attended the lectures in Hermanus (6) and Cape Town (1).

# PROGRAMME 4: SPACE OPERATIONS (SO)

## Highlights

- **Space operations for communication, navigation and science**
- **4 320 EO passes for SANSA with a success rate of 99.65%**
- **1 252 passes for the French Space Agency, CNES at an efficiency rate of 98%**
- **A total of 39 international supports concluded**
- **4 781 leaners engaged**
- **Total turnover of R76.4 million with a budgeted amount of R61 million**

## Programme Structure and Functional Scope

The Space Operations Programme is structured to respond to three outputs:

### Mission Control

Support of all EO satellite Sensors

SA satellite mission control

### Space Operations Services

Satellite Launch Support

Transfer-orbit Support (TOSS)

In-orbit Testing

Life and Emergency Support

Hosted Infrastructure

Carrier Monitoring

### Space Applications

Navigation

Space-based augmentation

## Functional scope

- Provide state-of-the-art ground station facilities and services 24/7
- Position South Africa globally and regionally in the space industry
- Improve Navigation signal accuracy and reliability

## Key Activities and Impact

### Performance Statistics

During the year under review, SANSA participated successfully in multiple satellite launch support initiatives. These included Transfer-orbit Support Services (TOSS) and Launch and Early-orbit Phase (LEOP) support. The technical support team achieved a remarkable Earth Observation proficiency score of 99,65%. The programme also exceeded 98,5% in providing the French Space Agency, CNES, with LEOP support.

### Activity 1 – Space Mission Support

Support services	Total
Transfer-Orbit Support Services (TOSS)	25
In-Orbit Testing (IOT) services	3
Drift support	3
Launch support services	1
Earth Station Verification Assistance (ESVA)	6

SANSA supported several international missions during the past financial year with a variety of support services as indicated above. The services ranged from TOSS to ESVA and were implemented with a 100% success rate.



## **Turksat-4B**

After a significant delay, the Turksat-4B communications satellite was launched from Baikonur Cosmodrome, Kazakhstan on 16 October 2015. SANSA successfully provided Telesat in Canada with Ku-Band TOSS for the launch and mission support for 17 days to place the satellite in its geosynchronous orbit at 50°E. The satellite is providing telecommunications and direct TV broadcasting services over a wide geographic region over Europe, Central Asia, the Middle East, Africa and western China.

## **Badr-7/ARABSAT-6B and GSAT-15**

Arianespace used an Ariane-5 ECA rocket to launch the Badr-7 and GSAT-15 satellites from Kourou in French Guiana on 10 November 2015. Badr-7 is the first 6th generation satellite in the Arabsat fleet and was co-located with the other Arabsat satellites at 26°E. The Badr-7 satellite, also known as Arabsat-6B, will provide direct-to-home television programming and broadband services over the Middle East, Africa and Central Asia.

## **Telestar-12V**

Telesat launched the Telestar-12V communications satellite was launched from the Tanegashima Space Centre in Japan on 24 November 2015 aboard a Japanese H-2A rocket to provide broadband communications coverage over the Americas, Atlantic Ocean, Europe, the Middle East and Africa. SANSA provided Telesat with Ku-Band, TOSS and IOT services during the launch and for an additional 14 days. The client congratulated the SANSA team for professionally managing a series of complicated manoeuvres while providing launch and in-orbit support.

## **Eutelsat-9B**

The Eutelsat-9B satellite was launched on 29 January 2016 with the European Space Agency's first European Data Relay Satellite (EDRS) system on-board to transmit communications between ground stations and satellites in low-Earth orbit. SANSA provided launch support and Ku-band TOSS for four days. The satellite is providing digital television and video programming across Europe.

## ***Ground Infrastructure Development***

The SANSA SO team completed the site infrastructure for the new HBX antenna at Hartebeesthoek on time for client sign-off in September 2015. The installation of the antenna, which CNES will use for its CORMORAN project, is in line with the technical aspects of the South African and French bilateral agreement. Given the delay of having to appoint a second contractor to complete the project, the SO team is proud of its 'on-time' achievement.

The On-Site Acceptance Review (OSAR) was conducted between 21-25 September 2015 and the installation of the antenna and related infrastructure completed in December 2015. A CNES-appointed Zodiac Data Systems (ZDS) team tested and approved the antenna and expressed satisfaction with and appreciation for the quality of the work and assistance from the SANSA staff.

## ***Activity 2 – SBAS-Africa Project***

SANSA's participation in the Satellite-Based Augmentation System (SBAS) Africa Project demonstrated the benefits of SBAS through a test-bed system under the aegis of the UK/SA Industrial Participation Project. The project consortium consisted of AVANTI, NSL, GMV, Pildo Labs,

Thales Alenia Space, CSIR Ghana, University of Bath, Traxis, Milway consulting and the SANSA Space Operations and Space Science programmes.

Project implementation required infrastructure to generate a SBAS signal, trials to use the signal and workshops to establish user requirements, as well as promoting SBAS, reporting trial results and proposing a roadmap for the future. Ground reference stations were deployed nationwide and the SBAS message communicated using the GMV MagicSBAS platform with dissemination through the Avanti-owned Artemis satellite.

Ground-based infrastructure was installed at SANSA Space Science in Hermanus and SANSA Space Operations at Hartebeesthoek, as well as in Madimbo, Twee Rivieren, Skukuza, the Sani Pass (Lesotho), Cape Hermes, Cape St Francis, Sutherland, and Keetmanshoop and Tsumeb in Namibia.

The infrastructure will remain as a legacy of the project for use by SANSA Space Science, Trignet (NGI) and Transnet. The network will also expand as a regional service in the SADC.

Meetings were held with the South African Maritime Safety Agency (SAMSA), South African Navy and Transnet National Ports Authority (NPA) to identify applications that can be developed further through analysis and trials.

#### Activity 3 – Monitoring Station Services

SANSA hosts a monitoring station for Japan's Quasi-Zenith Satellites System (QZSS). The system uses multiple satellites (GPS and QZSS) to provide high-accuracy satellite positioning services over almost all of Japan, including its

urban, canyon and mountain terrains.

Kongsberg Satellite Services (KSAT) in Norway contracted SANSA to prepare and equip a site for a monitoring station as part of its network services for Japan's NEC Corporation. The NEC is responsible for installing the QZSS ground control facilities globally.

#### Activity 4 – Ground Station Services

SANSA's ground station hosting services include logistics, civil works, power, rack space, heating ventilation and air-conditioning (HVAC), security, maintenance and support, and communications.

Spire contracted SANSA to host a ground station antenna to collect data from the educational amateur satellite platform and Earth-exploration data collection platform. Applications include large-area monitoring, as well as providing large institutional and commercial entities with environmental data to refine weather simulation models. SANSA provided the antenna shelter, power, rack space, IT network and maintenance and support, as well as 402 MHz frequency and 437 MHz amateur frequency licences to communicate with Spire's Earth exploration satellites and its amateur satellites respectively.

#### Activity 5 – Celebrating Women in Science, Engineering and Technology

More than 40 Grades 9-11 learners from schools in Atteridgeville and Florida attended the 4th annual Women in Science, Engineering and Technology event at Hartebeesthoek, jointly sponsored by the College of Science Engineering and Technology (CSET), Unisa's Girl-Power community engagement project and SANSA.

The event aims to stimulate interest among young girls in science, technology, engineering and mathematics (STEM) and choosing a career in one of these fields.

#### Activity 6 – High-altitude Balloons help Spur Interest in Space Technology

SANSA participated in the DST-sponsored 2015 Space Science Roadshow and 2015 World Space Week by, inter alia, partnering with the Secunda Amateur Radio Club (SARL) in a Balloon-Sat launch. The event replicated a “space-like” environment to spur the interest of high school learners in space science and technology and saw the launch of a number of high-altitude weather balloons.

Forty-five senior learners from four schools in Mpumalanga used the latest technologies to build their own payloads to launch on-board the balloon satellites. SANSA partnered with the Secunda Amateur Radio Club (SARL) in a BalloonSat launch Participants were exposed to physics, experimental research skills and space exploration.

SANSA increased its involvement by launching its own payload designed and built by the Satellite Operations technicians and tracked from a mobile ground station set up in Secunda. The SANSA team and learners collected real-time data from the payloads as they ascended.

Insert photos Girl Power, roadshow, BalloonSat launch

Caption: Participants in the Unisa 2015 Girl Power project working on their ‘Light and light-based technology’ project as a contribution to celebrating 2015 as the International Year of Light.

**Learners working on their payloads before the**



**Balloon-Sat launch in celebration of World Space Week 2015.**

#### Social responsibility

SANSA donated five sports kits to the Skeerpoort Primary School, a farm school located near Hartebeesthoek. Prior to the donation of the sports kits, learners had no school gear for participating in sports competitions with other schools. The sports kits consisted of three soccer and two netball kits.

*“Any donation, no matter how big or small, is always a blessing for us as the school does not always have the funds or means to do it alone. The learners and the staff of the Skeerpoort Primary School would like to thank you for the wonderful donation. Our school and children will really benefit from it.” - Johan Human, acting principal: Skeerpoort Primary School*

# PROGRAMME 5: SPACE ENGINEERING (SE)

## Highlights

- **Space technology for innovation and global competitiveness**
- **56% project progress made towards the 25% annual target**
- **53 jobs directly supported by the satellite programme**
- **R94 million total outsourced expenditure to industry**

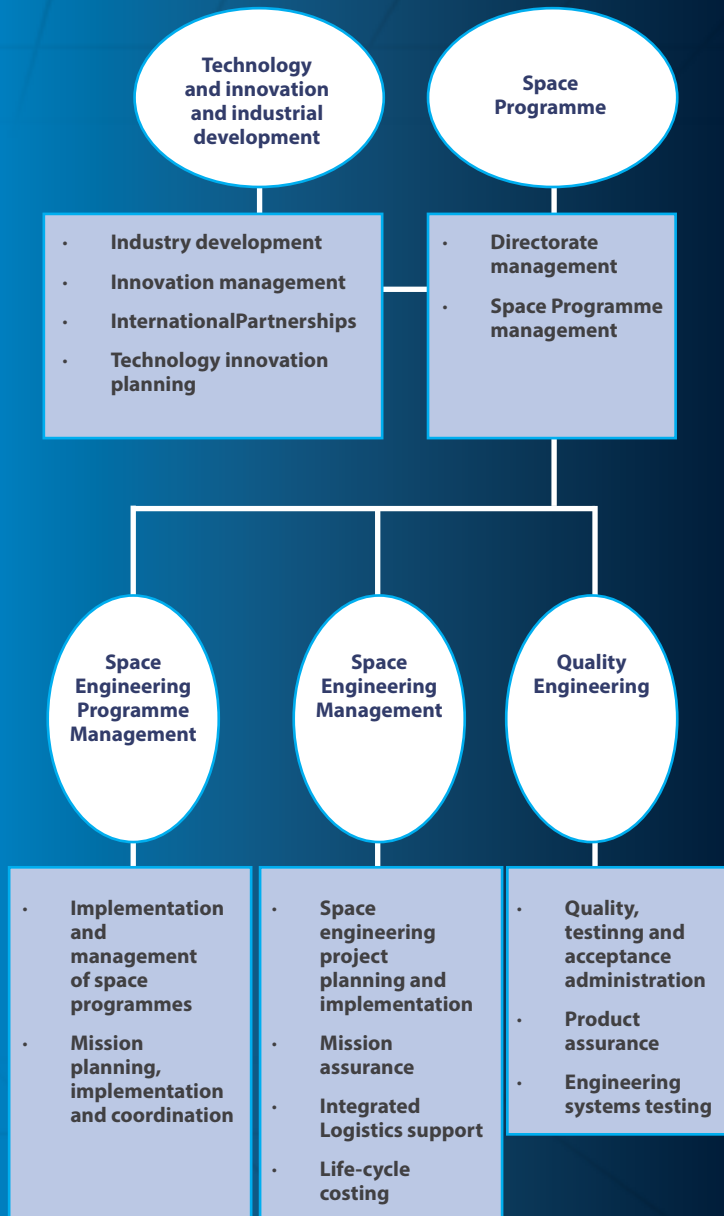
## Functional Scope

SANSA's Space Engineering Programme (SEP) provides systems engineering and project management expertise and drives the satellite build programme in South Africa in partnership with primary contractors, R&D institutions and private sector partners.

- Space engineering programme Management
  - Develop South Africa's capability in space systems
- Industrial Development
  - Develop local space industry for wider impact on the economy
- Science Advancement and HCD
  - Create awareness and appreciation of science and technology among youth, public and policy makers and drive HCD in engineering

The programme conducts satellite and sub-systems analysis, leads the technical side of space programme management, provides human capital development in space engineering and facilitates private space industry partnerships. Programme initiatives support the NDP and promote manufacturing and technology development in South Africa.

## Programme Structure and Functional Scope



## Key Activities and Impact

### Activity 1 – EO-Sat1 Programme

The purpose of the EO-Sat1 programme is to generate and deliver reliable and accurate information on food security, natural resources and environmental processes to stakeholders within government, industry and academia, as well as other national or international users and customers. The operational mission aims to fulfil the recurring socio-economic user needs with a quality data source that is reliable and sustainable.

During the review period, activities focused on developing the technical aspects and procuring the full optics and engineering sensor models. The satellite programme was also consolidated into a single, sustainable and comprehensive plan with a well-defined costing model for the entire life-cycle of the satellite, from conception to decommissioning.

The System Definition Review (SDR) took place in December 2015. A prototype reaction wheel was developed as the primary actuator that controls the satellite's attitude in orbit and good made with reviewing the preliminary designs of several of the satellite's major components. These included the generic interface unit, magnetic sub-system interface and controller and experimental payload. The horn antenna prototypes for the X-band transmitter, as well as the power distribution units and on-board computer for managing the satellite, were completed. Currently and going forward, the Space System Level 6 engineering documentation is being developed in preparation for the design review at the end of the 2017/18 financial year.



### ***EO-SAT1 satellite***

Developments during the past financial year also included:

- Procurement of the optics and sensor engineering model for the satellite programme.
- Determination of the best possible options for the critically important AIT facilities that will support the local space industry and other technology areas in South Africa.
- Development of a life-cycle costing model for the DST to identify various technology options for EO-Sat1 as constraints experienced during the year required a review of the original scope.
- Prototype development of the satellite reaction wheel.
- On-board computer and communications unit for VHF/UHF communications.

#### **Activity 2 - Local and International Collaboration**

Algeria, South Africa, Nigeria and Kenya are members of the African Resource and Environmental Management Constellation (ARMC). Under this partnership, each country

is expected to contribute a satellite to a constellation of four Earth observation satellites. The purpose is to create economies of scale, share data resources and improve the temporal resolution for data products and services on the continent.

SANSA signed a MoU with the Algerian Space Agency (ASAL) in 2013 to cooperate in space science and technology and visited ASAL in Algiers in 2014. SANSA and ASAL used the EO-Sat1 programme as a model to explore the best co-development principles for the partnership.

SANSA assisted the DST with new regulations for space debris and the proposed hosting of the UN Workshop on Small Satellites by South Africa at the UNCOPUOS General Assembly in Vienna, Austria. Discussions about regulations for space debris are ongoing within the UNCOPUOS Scientific and Technical Sub-Committee and SANSA and ASAL announced their joint satellite development programme during the Agenda Item 8 discussion on space and sustainable development.

#### **Activity 3 - National Space Industry**

The implementation of the National Space Programme (NSP) will support a sustainable space programme and ensure the development of public/private partnerships in and long-term growth of the South African space industry. In this regard, SANSA established the SANSA Intellectual Property and SANSA Industry Development and Localisation policies to support and guide participation by the space industry in the satellite build programme.

## Implementing the National Space Programme (NSP)

Progress with the implementation of the identified NSP project areas are rated in Table 11.

**Table 11: Consolidated report on the National Space Programme (NSP) implementation**

NSP IMPLEMENTATION : CONSOLIDATED REPORT			
Project area		Project description	Rating
NSP Core Administration and Governance (NSP CAG)	P1	Space Coordination & Industrial Development	1.3
	P2	Space Programme Management	2.3
	P3	Infrastructure and Facilities Management	0.4
	P4	Human Capital Development	0.4
	P5	Science Advancement and Space Awareness	1.0
	P6	International Partnerships	3.2
National Earth Observation Programme (NEOP)	P1	EODC at SANSA	3.6
	P2	Remote Sensing and Data Management Competence Development	3.2
	P3	Applications development and deployment	3.5
	P4	EO for Earth System and Global Change Research	2.5
	P5	Human Capacity Development (HCD)	2.6
	P6	Cyber Infrastructure	2.8
	P7	Science Advancement	3.6
	P8	User Needs and Future Vision Initiatives	3.5
	P9	African Resource Management Constellation (ARMC)	3.3
National Space Science Programme (NSSP)	P1	Magnetic Anomaly Investigations	2.5
	P2	Status of the Space Environment	3.6
	P3	Space Science in Remote Areas	3.9
	P4	Hazard Mitigation and Disaster Management	3.0
	P5	Applied Electromagnetic Technology	4.3
	P6	Infrastructure and Facilities	2.8
	P7	Human Capacity Development	3.6
	P8	Science Advancement	4.3
National Space Engineering Programme (NSEP)	P1	Technology and Mission Development	1.2
	P2	Nano and Pico-satellites	2.3
	P3	Mini Satellites	4.0
	P4	Micro-satellites	1.0
	P5	Industrial Development and Commercial Opportunities	2.2
	P6	Infrastructure and Facilities	1.5
	P7	Human Capacity Development	1.4
	P8	Science Advancement	3.0

NSP IMPLEMENTATION : CONSOLIDATED REPORT			
Project area		Project description	Rating
National Space Operations Programme (NSOP)	P1	Telemetry, Tracking and Command (TT&C)	4.7
	P2	Mission Control	0.0
	P3	Navigation	3.0
	P4	Communications	0.0
	P5	Infrastructure and Facilities	4.2
<b>Progress and rating explanation</b>			
		<b>Progress</b>	<b>Rating</b>
		Not started	0
		Bad/Poor	1 or more, but less than 3
		Satisfactory	3 or more, but less than 4
		Excellent	Between 4 and 5, both inclusive

#### Activity 4 – Monetising Space Value

SANSA is quantifying the public value of applying satellite technology in areas such as agriculture, natural resource management, space-based decision-making and service delivery, national security and disaster management.

An example of costs saved is the single-licence, multi-user access to satellite data. Currently, the annual cost for these data, through SANSA's Direct Receiving Station (DRS) for 2015/16 SPOT-6 imagery, is about R49.9 million (including a down-payment on the data acquisition terminal hardware and software and direct operating costs for SPOT data).

The commercially listed price to access these data is about R349.5 million. The cost-saving or quantified benefit, therefore, is about R299.6 million.



# INDEPENDENT AUDITOR'S REPORT



# INDEPENDENT AUDITOR'S REPORT TO PARLIAMENT ON THE SOUTH AFRICAN NATIONAL SPACE AGENCY

## Report on the financial statements

### Introduction

We have audited the financial statements of the South African National Space Agency set out on pages 110 to 184, which comprise the statement of financial position as at 31 March 2016, the statement of financial performance, statement of changes in net assets, cash flow statement and the statement of comparison of budget with actual amounts for the year then ended, as well as the notes, comprising a summary of significant accounting policies and other explanatory information.

### Accounting authority's responsibility for the financial statements

The accounting authority, is responsible for the preparation and fair presentation of these financial statements in accordance with the Standards of Generally Recognised Accounting Practice (GRAP) and the requirements of the Public Finance Management Act of South Africa, 1999 (Act No. 1 of 1999) (PFMA) and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

### Auditor's responsibility

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

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

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

## Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of the South African National Space Agency as at 31 March 2016 and its financial performance and cash flows for the year then ended, in accordance with GRAP and the requirements of the PFMA.

## Report on other legal and regulatory requirements

In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) and the general notice issued in terms thereof, we have a responsibility to report findings on the reported performance information against predetermined objectives of selected objectives presented in the annual report, compliance with legislation and internal control. We performed tests to identify reportable findings as described under each subheading but not to gather evidence to express assurance on these matters. Accordingly, we do not express an opinion or conclusion on these matters.

## Predetermined objectives

We performed procedures to obtain evidence about the usefulness and reliability of the reported performance information of the following selected objectives presented in the annual performance report of the public entity for the year ended 31 March 2016:

- Strategic Goal 1: Address South Africa's challenges through space services and products on page 52
- Strategic Goal 3: Develop national human capacity and ensure transformation on page 53
- Strategic Goal 4: Enhance the competitiveness of the South African space industry on pages 53 to 55

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

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

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

### **Additional matter**

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

### **Achievement of planned targets**

Refer to the annual performance report on pages 51 to 57; for information on the achievement of the planned targets for the year.

### **Compliance with legislation**

We performed procedures to obtain evidence that the public entity had complied with legislation regarding financial matters, financial management and other related matters. We did not identify any instances of material non-compliance with specific matters in key legislation, as set out in the general notice issued in terms of the PAA.

### **Internal control**

We considered internal control relevant to our audit of the financial statements, annual performance report and compliance with legislation. We did not identify any significant deficiencies in internal control.

### **Other reports**

We draw attention to the following engagements that could potentially impact on the public entity's financial, performance and compliance related matters. Our opinion is not modified in respect of these engagements that are either in progress or have been completed.

### **Audit-related services and special audits**

An agreed-upon procedures engagement was performed on donor funding concerning the application of grant funding received from the National Research Foundation (NRF) and the Technology and Human Resources for Industry Programme (THRIP GRANTS) for the period 1 January 2015 to 31 December 2015. The report was issued to the South African National Space Agency Management on 20 June 2016.



SizweNtsalubaGobodo Inc.

Anton Van den Heever

Director

Registered auditor

31 July 2016

# annual FINANCIAL STATEMENTS



## STATEMENT OF FINANCIAL POSITION – For the year ended 31 March 2016

	Note	2016 R	2015 R
<b>ASSETS</b>			
<b>Current Assets</b>		<b>199 397 438</b>	<b>145 997 762</b>
Cash and Cash Equivalents	5	178 458 539	123 228 549
Receivables from Exchange Transactions	6	18 046 991	17 443 498
Receivables from Non-Exchange Transactions	6,2	2 540 088	2 407 214
Receivable held on behalf of Principal	18	-	2 583 090
Inventory	7	351 820	335 411
<b>Non-Current Assets</b>		<b>279 597 014</b>	<b>192 881 432</b>
Property, Plant and Equipment	8	257 881 588	164 831 024
Intangible Assets	9	21 715 426	28 050 408
<b>Total Assets</b>		<b>478 994 452</b>	<b>338 879 194</b>
<b>LIABILITIES</b>			
<b>Current Liabilities</b>		<b>155 554 013</b>	<b>125 425 823</b>
Trade and Other Payables from Exchange Transactions	10	38 281 160	25 195 017
Provisions	11	6 961 610	6 160 602
Liability held on behalf of Principal	18	22 083 483	-
Committed Conditional Grant	12	82 335 930	89 146 354
Current Portion -Long Term Liability	13	5 891 830	4 588 815
Current Portion of Finance Lease	14	-	102 992
Operating Lease Liability	14,1	-	232 043
<b>Non-Current Liabilities</b>		<b>5 891 799</b>	<b>9 177 630</b>
Non -Current Portion -Long Term Liability	13	5 891 799	9 177 630
<b>Total Liabilities</b>		<b>161 445 812</b>	<b>134 603 453</b>
<b>NET ASSETS</b>		<b>317 548 640</b>	<b>204 275 741</b>
Accumulated Surplus	15	317 548 640	204 275 741
<b>Total Net Assets</b>		<b>317 548 640</b>	<b>204 275 741</b>

## STATEMENT OF FINANCIAL PERFORMANCE – For the year ended 31 March 2016

	Note	2016 R	2015 R
<b>REVENUE</b>			
<b>Revenue from Non-exchange Transactions</b>			
Transfers and Subsidies Received	17	232 441 074	163 585 721
<b>Revenue from Exchange Transactions</b>			
Interest Income	16	8 394 522	5 579 080
Rendering of Services	30	96 828 628	67 681 755
Other Income	19	939 808	668 054
Net Gains/Losses on foreign exchange transactions	28	-	2 179 815
<b>Total Revenue</b>		<b>338 604 032</b>	<b>239 694 425</b>
<b>EXPENDITURE</b>			
Employee Related Costs	20	96 046 176	93 019 880
Board Member Remuneration	21	914 270	650 119
Depreciation and Amortisation	22	25 097 187	22 902 663
Impairment of Intellectual Property	22	-	1 440 000
Repairs and Maintenance		8 355 117	7 586 042
Finance Costs	23	10 202	49 680
Data Licence fees	31	31 406 738	26 729 023
Grants and Subsidies Paid	24	3 622 398	2 672 002
Antenna Infrastructure Services	25	4 146 811	1 102 997
Training Expenses	26	1 733 802	1 578 863
General Expenses	27	47 378 832	50 160 312
Net Losses on foreign exchange transactions	28	5 470 529	-
Loss on Disposal of Property, Plant and Equipment	29	1 149 071	149 771
<b>Total Expenditure</b>		<b>225 331 133</b>	<b>208 041 352</b>
<b>SURPLUS FOR THE YEAR<sup>1</sup></b>		<b>113 272 899</b>	<b>31 653 073</b>

<sup>1</sup> The surplus for the year mainly represents capital transfers declared in revenue of R99 million. The expenditure is reflected as Property, Plant and Equipment in the Statement of Financial Position. Refer to Note 17.1.3 for a detailed analysis of capital transfers recognised in revenue.

## STATEMENT OF CHANGES IN NET ASSETS

For the year ended 31 March 2016

Description	Accumulated Surplus R	Total R
<b>2015</b>		
<b>Balance at 1 April 2014</b>	<b>172 622 668</b>	<b>172 622 668</b>
Surplus for the year	31 653 073	31 653 073
<b>Balance as at 31 March 2015 (restated)</b>	<b>204 275 741</b>	<b>204 275 741</b>
<b>2016</b>		
<b>Balance at 1 April 2015 (restated)</b>	<b>204 275 741</b>	<b>204 275 741</b>
Surplus for the year	113 272 899	113 272 899
<b>Balance at 31 March 2016</b>	<b>317 548 640</b>	<b>317 548 640</b>



## CASH FLOW STATEMENT – For the year ended 31 March 2016

	Note	2016 R	2015 R
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>			
<b>Receipts</b>			
Grants	17	232 441 074	163 585 721
Grants received on behalf of Principal	18	58 892 000	-
Sales of goods and services		96 828 628	67 681 755
Interest Received		8 394 522	5 579 080
Other Receipts		939 808	2 847 869
<b>Payments</b>			
Employee Costs		(96 046 176)	(90 265 552)
Suppliers		(93 363 702)	(55 532 317)
Payments on behalf of Principal	18	(34 225 427)	(17 750 534)
Interest Paid		(10 202)	(49 680)
<b>NET CASH FLOWS FROM / (USED IN) OPERATING ACTIVITIES</b>	<b>32</b>	<b>173 850 525</b>	<b>76 096 342</b>
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>			
Purchase of Property, Plant and Equipment	8	(113 353 141)	(57 788 358)
Purchase of Intangible Assets	9	(179 776)	(29 672 564)
<b>NET CASH FLOWS (USED IN) INVESTING ACTIVITIES</b>		<b>(113 532 917)</b>	<b>(87 460 922)</b>
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>			
Movement in Finance Lease Liability		-	(103 000)
Movement in Long term liability		(5 087 618)	14 054 235
<b>NET CASH FLOWS (USED IN)/ FROM FINANCING ACTIVITIES</b>		<b>(5 087 618)</b>	<b>13 951 235</b>
<b>NET INCREASE IN CASH AND CASH EQUIVALENTS</b>		<b>55 229 990</b>	<b>2 586 655</b>
Cash and Cash Equivalents at the beginning of the year	5	123 228 549	120 641 894
Cash and Cash Equivalents at the end of the year	5	178 458 539	123 228 549

## STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS – For the year ended 31 March 2016

	Note	Approved Budget	Final Budget	Actual Amounts on a Comparable Basis	Difference
		R	R	R	R
<b>Revenue</b>					
<b>Revenue from Non-exchange Transactions</b>					
Parliamentary Grant		223 820 350	326 565 152	311 040 648	(15 524 504)
Ring Fenced Transfers	4.3.1	124 355 050	124 355 000	124 355 000	-
Research Grants		97 466 000	193 617 000	177 486 500	(16 130 500)
		1 999 300	8 593 152	9 199 148	605 996
<b>Revenue from Exchange Transactions</b>					
Contract Income: Public	4.3.2	62 821 180	83 610 000	106 980 464	23 370 464
Contract Income: Private		17 248 840	38 972 000	39 024 304	52 304
Contract Income: Foreign	4.3.3	420 000	524 000	1 241 507	717 507
	4.3.3	45 152 340	44 114 000	66 714 653	22 600 653
<b>Finance and other Income</b>	<b>4.3.4</b>	449 000	14 721 227	9 334 329	(5 386 898)
<b>Prior years Surplus Retained</b>			11 831 714	11 831 714	-
<b>Total Revenue</b>		<b>287 090 530</b>	<b>436 728 093</b>	<b>439 187 155</b>	<b>2 459 062</b>
Economic Classification					
<b>Current Payments</b>					
Compensation of Employees	4.3.5	102 805 292	105 462 491	96 046 176	(9 416 315)
Board Costs		500 000	743 551	914 270	170 719
Goods and services	4.3.6	90 683 238	182 502 227	162 596 114	(19 906 113)
		<b>193 988 530</b>	<b>288 708 269</b>	<b>259 556 560</b>	<b>(29 151 709)</b>
<b>Payments for Capital Assets</b>					
Machinery and Equipment	4.3.7	8 391 000	13 564 982	13 438 207	(126 775)
Software and intangible Assets	4.3.8	1 700 000	8 622 842	179 776	(8 443 066)
Vehicles		500 000	300 000	829 839	529 839
Satellite Development	4.3.9	82 511 000	125 532 000	99 085 095	(26 446 905)
		<b>93 102 000</b>	<b>148 019 824</b>	<b>113 532 917</b>	<b>(34 486 907)</b>
<b>Total Expenditure</b>		<b>287 090 530</b>	<b>436 728 093</b>	<b>373 089 477</b>	<b>(63 638 616)</b>
Surplus/Deficit		-	-	66 097 678	66 097 678

## STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS – For the year ended 31 March 2016 (cont.)

### Reconciliation of Actual amounts on a Comparable Basis and Actual amounts on the annual financial statements

#### Net Cash flows from

Actual Amount on Comparable Basis as Presented in  
the Budget and Actual Comparative Statement

Basis Differences

Timing Differences

Entity Differences

#### Actual amount in Cash Flow Statement

Operating Activities	Financing Activities	Investing Activities	Total
R	R	R	R
<b>179 630 595</b>	-	<b>(113 532 917)</b>	<b>66 097 678</b>
(5 780 070)	(5 087 618)	-	(10 867 688)
-	-	-	-
-	-	-	-
<b>173 850 525</b>	<b>(5 087 618)</b>	<b>(113 532 917)</b>	<b>55 229 990</b>

## ACCOUNTING POLICIES FOR THE YEAR ENDED 31 March 2016

### 1. BASIS OF PRESENTATION

The annual financial statements have been prepared using the accrual basis of accounting, in terms of which items are recognised as assets, liabilities, net assets, revenue and expenses when they satisfy the definitions and recognition criteria for those elements, which in all material aspects are consistent with those applied in the previous year, except where a change in accounting policy has been recorded. The historic cost convention has been used, except where indicated otherwise.

The Annual Financial Statements are prepared in South African Rand (R) and have been prepared on a going concern basis.

#### **Statement of compliance**

The Annual Financial Statements have been prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP), including any interpretations and directives issued by the Accounting Standards Board (ASB) and the Public Finance Management Act (PFMA).

The presented Annual Financial Statements have been rounded to the nearest Rand value. The impact that the rounding will have on the disclosed numbers in the Annual Financial Statements, will not be material and should not significantly understate nor overstate the reported numbers.

### 1.1 CHANGES IN ACCOUNTING POLICY AND COMPARABILITY

Accounting Policies have been consistently applied, except where otherwise indicated below:

The Accounting Policies applied are consistent with those used to present the previous year's financial statements, unless explicitly stated.

The entity changes an Accounting Policy only if the change:

- (a) is required by a Standard of GRAP; or
- (b) results in the financial statements providing reliable and more relevant information about the effects of transactions, other events or conditions on the entity's financial position, financial performance or cash flow.

The details of any changes in accounting policies and comparative restatements are explained in the relevant policy.

### 1.2 CRITICAL JUDGEMENTS, ESTIMATIONS AND ASSUMPTIONS

In the application of the entity's accounting policies, which are described below, management is required to make judgements, estimates and assumptions about the amounts of assets, liabilities, revenue and expenses that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

These estimates and underlying assumptions are reviewed on an on-going basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

The following are the critical judgements that management have made in the process of applying the entity's Accounting Policies and have the most significant effect on the amounts recognised in the Annual Financial Statements:

### **1.2.1 Financial assets and liabilities**

The classification of financial assets and liabilities, into categories, is based on the relevant GRAP standards and the terms of the instruments. Accounting Policy 1.7.2 on Financial Assets Classification and Accounting Policy 1.7.3 on Financial Liabilities Classification describe the factors and criteria considered by the management of the entity in the classification of financial assets and liabilities.

In making the above-mentioned judgement, management considered the definition and recognition criteria for the classification of financial instruments as set out in GRAP.

### **1.2.2 Impairment of financial assets**

Accounting Policy 1.7.5 on Impairment of Financial Assets describes the process followed to determine the value by which financial assets should be impaired. In making the estimation for impairment, management of the entity considered the detailed criteria for impairment of financial assets as set out in GRAP, and used its judgement to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of the reporting period. Management of the entity is satisfied that impairment of financial assets recorded during the year is appropriate.

Calculation in respect of impairment of debtors is based on an assessment of the extent to which debtors have defaulted on payments already due, and an assessment of their ability to make payments based on their creditworthiness.

### **1.2.3 Useful lives of Property, Plant and Equipment and Intangible Assets**

Property, plant and equipment and intangible assets are depreciated over their useful life taking into account residual values, where appropriate. The useful lives of the assets and residual values are assessed annually and may vary depending on a number of factors. In re-assessing useful lives, factors such as technological innovation and maintenance programmes are taken into account. Residual value assessments consider issues such as future market conditions, the remaining life of the asset and projected disposal values.

### **1.2.4 Impairment: Write down of Property, Plant and Equipment and Intangible Assets**

Property, plant and equipment and intangible assets are considered for impairment if there is a reason to believe that impairment may be necessary. The future cash flows expected to be generated by the assets are projected taking into account market conditions and the expected useful lives of the assets. The present value of these cash flows, determined using an appropriate discount rate, is compared to the current carrying value and, if lower, the assets are impaired to the present value taking into account the reasonable cost of replacement.

In making the above-mentioned estimates and judgement, management considered the subsequent measurement criteria and indicators of potential impairment losses as set out in GRAP 17: Property, Plant and Equipment and GRAP 31: Intangible assets. In particular, the calculation of the recoverable service amount for PPE and intangible assets involves significant judgment by management.

### **1.2.5 Provisions and Contingent Liabilities**

Management judgement is required when recognising and measuring provisions and when measuring contingent liabilities. Provisions are discounted where the effect of discounting is material using actuarial valuations. The amount of a provision is the best estimate of the expenditure expected to be required to settle the present obligation at the reporting date. SANSA recognises provision for bonuses based on the expected performance bonuses to be paid out to employees.

### **1.2.6 Revenue Recognition**

Accounting Policy 1.9.2 on *Revenue from Exchange Transactions* and Accounting Policy 1.9.3 on *Revenue from Non-exchange Transactions* describe the conditions under which revenue will be recorded by management of the entity.

In making their judgement, management considers the detailed criteria for the recognition of revenue as set out in GRAP 9: Revenue from Exchange Transactions and GRAP 23: Revenue from Non-Exchange transactions, as far as Revenue from Exchange and Non-Exchange Transactions is concerned. In particular, revenue from services rendered is recognised in surplus or deficit in proportion to the stage of completion of the transaction at the reporting date.

The stage of completion is assessed by reference to work performed as at the reporting date. Contract revenue includes the initial amount agreed in the contract plus any variations in contract work, claims and incentive payments to the extent that it is probable that these will result in revenue and can be measured reliably. As soon as the outcome of a contract can be estimated reliably, contract revenue and expenses are recognised in profit or loss in proportion to the stage of completion of the contract.

The stage of completion is assessed by reference to work performed as at reporting date. When the outcome of a contract cannot be estimated reliably, contract revenue is recognised only to the extent of contract costs incurred that are likely to be recoverable. An expected loss on a contract is recognised immediately in surplus or deficit.

Management of the entity is satisfied that recognition of the revenue in the current year is appropriate.

### **1.2.7 Going Concern Assumption**

The Annual Financial Statements have been prepared on a going concern basis. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent liabilities and commitments will occur in the ordinary course of business.

### 1.3 OFFSETTING

Assets, liabilities, revenues and expenses have not been offset except when offsetting is required or permitted by a standard of GRAP.

### 1.4 STANDARDS, AMENDMENTS TO STANDARDS AND INTERPRETATIONS ISSUED BUT NOT YET EFFECTIVE

Standard number	Standard name	Effective date (if applicable)
GRAP 20	Related party disclosures	No effective date
GRAP 32	Service Concession Arrangements: Grantor	No effective date
GRAP 108	Statutory Receivables	No effective date
GRAP 109	Accounting by Principals and Agents	No effective date

#### **GRAP 20 – Related parties**

This standard provides the requirements for the disclosure of related parties and transactions and balances with related parties. This standard was based on IPSAS 20 as currently applied by the entity for its related party disclosures. Accordingly it is not expected that the adoption of this standard will have a material impact on the financial statements of the entity. This standard does not yet have an effective date.

#### **GRAP 32 – Service Concession Arrangements: Grantor**

The objective of this Standard is to prescribe the accounting for service concession

arrangements by the grantor, a public sector entity. The implementation of the statement will not be applicable to SANSA currently as SANSA is not an operator providing a mandated function related to the service concession asset.

#### **GRAP 108 Statutory Receivables**

The objective of this Standard is to prescribe accounting for the recognition, measurement, presentation and disclosure of statutory receivables. The standard will not have an impact on SANSA as SANSA is a schedule 3A public entity as listed in the PFMA however if SANSA was to be listed as a schedule 3B National Government Business Enterprise it would have to register for VAT and Income Tax and thus the statement will be applicable.

#### **GRAP 109 Accounting by Principals and Agents**

The objective of this Standard is to outline principles to be used by an entity to assess whether it is party to a principal-agent arrangement, and whether it is a principal or an agent in undertaking transactions in terms of such an arrangement. This Standard does not introduce new recognition or measurement requirements for revenue, expenses, assets and/or liabilities that result from principal-agent arrangements. The Standard does however provide guidance on whether revenue, expenses, assets and/or liabilities should be recognised by an agent or a principal, as well as prescribe what information should be disclosed when an entity is a principal or an agent.

The statement will be applicable to SANSA and will provide clear guidance on the recognition criteria used to recognise revenue and related expenditure. However since the statement does not change the recognition criteria as detailed in GRAP 23: Revenue from non-exchange transactions, SANSA does not anticipate that there will be any changes to its accounting policies.

## **1.5 PROPERTY, PLANT AND EQUIPMENT**

### **1.5.1 Initial Recognition and Subsequent Measurement**

Property, plant and equipment are measured at cost, net of accumulated depreciation and/ or accumulated impairment losses, if any. Property, plant and equipment are tangible assets which are held for use in the production or supply of goods and services or for administrative purposes and are expected to be used during more than one financial period.

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

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

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and significant costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised. All Property, Plant and Equipment is measured at cost, less depreciation, less impairment subsequent to the initial recognition.

Where an asset is acquired at no cost, (i.e. non-exchange transaction), its cost will be its fair value as at the date of acquisition.

All repairs and maintenance costs are recognised in surplus or deficit as incurred. The present value of the initial expected estimate cost for the decommissioning of the asset after its use is included in the cost of the respective asset if the recognition criteria for an allowance is met. When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

### **1.5.2 Depreciation**

Depreciation is recognised in surplus or deficit on a straight line basis over the estimated useful lives of each part of an item of property, plant and equipment:

- a. Freehold land  
Land has an unlimited useful life and therefore is not depreciated but stated at cost less any impairment losses.
- b. Freehold building  
SANSA identified the following major components of buildings.
  - Buildings
  - Alterations and other fixtures



- The useful lives of the various components of buildings have been assessed to be:
- Buildings 15-50 years
- Alterations and other fixtures 14-15 years
- c. Equipment and Motor Vehicles  
The useful lives of the various categories of equipment and vehicles have been assessed to be:
- Office furniture 3-10 years
- Motor vehicles 3-10 years
- Computer equipment 1-10 years
- Research equipment 2-15 years
- Plant & Machinery 2-20 years
- Office Equipment 3-10 years
- Exhibits 10 years

### **Leasehold improvements**

These improvements are depreciated over the shorter of the contract period or the assessed useful lives of the assets.

The residual values, depreciation methods and useful lives of the asset categories are reviewed at each financial year end and adjusted if necessary. If the expectations differ from previous estimates, the change is accounted for as a change in accounting estimate.

### **Derecognition**

An item of property, plant and equipment is derecognised upon disposal or when no future economic benefits or service potential is expected from its use or disposal. The gain or loss arising from the derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

### **1.5.3 Impairment of Non-Financial Assets**

Cash generated units are determined as the smallest identified group of assets which can generate cash flows independently from other assets or groups of assets. Non-cash generating assets are primarily held for service delivery purposes.

### 1.5.3.1 Cash Generating Assets

The entity assesses at each reporting date whether there is any indication that an asset may be impaired. If any such indication exists, the entity estimates the recoverable amount of the individual asset.

If there is any indication that an asset may be impaired, the recoverable amount is estimated for the individual asset. If it is not possible to estimate the recoverable amount of the individual asset, the recoverable amount of the cash-generating unit to which the asset belongs is determined.

A cash generating unit is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets.

The recoverable amount of an asset or a cash-generating unit is the higher of its fair value less costs to sell and its value in use.

If the recoverable amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. That reduction is an impairment loss.

An impairment loss of assets carried at cost less any accumulated depreciation or amortisation is recognised immediately in surplus or deficit.

An impairment loss is recognised for cash-generating units if the recoverable amount of the unit is less than the carrying amount of the unit. The impairment loss is allocated to reduce the carrying amount of the assets of the unit as follows:

- to the assets of the unit, pro rata on the basis of the carrying amount of each asset in the unit.

An entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets may no longer exist or may have decreased. If any such indication exists, the recoverable amounts of those assets are estimated and the carrying amount is increased to the recoverable amount.

The increased carrying amount of an asset attributable to a reversal of an impairment loss should not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in surplus or deficit.

### 1.5.3.2 Non-Cash Generating Assets

The entity assesses at each reporting date whether there is any indication that an asset may be impaired. If any such indication exists, the entity estimates the recoverable service amount of the asset.

The recoverable service amount is the higher of a non-cash generating asset's fair value less costs to sell and its value in use. The value in use for a non-cash generating asset is the present value of the asset's remaining service potential.

If the recoverable service amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable service amount. That reduction is an impairment loss and is recognised in surplus/deficit.

An impairment loss is recognised for non cash-generating units if the recoverable service amount of the unit is less than the carrying amount of the unit. The impairment loss is allocated to reduce the carrying amount of the assets of the unit as follows:

- to the assets of the unit, pro rata on the basis of the carrying amount of each asset in the unit.

An entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets may no longer exist or may have decreased. If any such indication exists, the recoverable service amounts of those assets are estimated and increases the carrying amount to the recoverable service amount.

The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in surplus or deficit.

## **1.6 INTANGIBLE ASSETS**

An intangible asset is recognised when:

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

Intangible assets are initially recognised at cost.

Expenditure on research (or on the research phase of an internal project) is recognised in surplus or deficit when it is incurred.

An intangible asset arising from development (or from the development phase of an internal project) is recognised when:

- it is technically feasible to complete the asset so that it will be available for use or sale;
- there is an intention to complete and use or sell it;
- there is an ability to use or sell it
- it will generate probable future economic benefits
- there are available technical, financial and other resources to complete the development and to use or sell the asset; and
- the expenditure attributable to the asset during its development can be used reliably.

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the asset to which it relates. The amortisation is calculated at a rate considered appropriate to reduce the cost of the asset less residual value over the shorter of its estimated useful life or contractual period. Residual values and estimated useful lives are reviewed annually. The amortisation method used is the straight line method.

Intangible assets that meet the recognition criteria are stated in the statement of financial position at amortised cost, being the initial cost price less any accumulated amortisation and impairment losses. The assets residual values, useful lives and methods of amortisation are reviewed at each financial year end, and adjusted prospectively if appropriate. Amortisation is charged to surplus or deficit so as to write off the cost of intangible assets over their estimated useful lives, using the straight-line method as follows:

- Computer Software : 3 years

An item of intangible assets is derecognised upon disposal or when no future economic benefits or service potential are expected from its use or disposal. The surplus or deficit arising from the DE recognition of an item of intangible assets is included in the surplus or deficit when the item is derecognised. The surplus or deficit arising from the DE recognition of an item of intangible assets is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

## **1.7 FINANCIAL INSTRUMENTS**

The entity has various types of financial instruments and these can be broadly categorised as either financial assets, financial liabilities or equity instruments in accordance with the substance of the contractual agreement .

### **1.7.1 Initial Recognition**

Financial assets and financial liabilities are recognised on the entity's Statement of Financial Position when the entity becomes party to the contractual allowances of the instrument, therefore trade date accounting applies.

The entity does not offset a financial asset and a financial liability unless a legally enforceable right to set off the recognised amounts currently exists; and the entity intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously.

### **1.7.2 Financial Assets - Classification**

A financial asset is any asset that is cash or a contractual right to receive cash or another financial assets.

The financial assets of the entity are classified as Financial instruments at amortised cost.

The Financial assets are carried at cost are investments in residual interests that do not have a quoted market price in an active market, thus fair value cannot be reliably measured.

The entity has the following types of financial assets as reflected on the face of the Statement of Financial Position or in the notes thereto:

Type of Financial Asset	Classification
Bank Balances and Cash	Financial instruments at amortised cost
Trade receivables	Financial instruments at amortised cost

Cash includes cash on hand (including petty cash) and cash with banks. Cash equivalents are short-term highly liquid investments, readily convertible into known amounts of cash, that are held with registered banking institutions with maturities of three months or less and are subject to an insignificant risk of change in value. For the purposes of the cash flow statement, cash and cash equivalents comprise cash on hand, deposits held on call with banks, net of bank overdrafts.

Trade receivables consists of amounts due by customers within a 30 day collection period.

### 1.7.3 Financial Liabilities - Classification

A financial liability is a contractual obligation to deliver cash or another financial asset to another entity. The entity has the following types of financial liabilities as reflected on the face of the Statement of Financial Position or in the notes thereto:

Type of Financial Asset	Classification
Bank Balances and Cash	Financial instruments at amortised cost
Trade receivables	Financial instruments at amortised cost

There are three main categories of Financial Liabilities, the classification determining how they are measured. Financial Liabilities may be measured at:

- (i) Fair value or
- (ii) Amortised cost or
- (iii) Cost

### 1.7.4 Initial and Subsequent Measurement

#### Financial Assets:

Financial Assets (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset. Subsequent to initial recognition, financial assets are measured at amortised cost.

#### Financial Liabilities:

Financial Liabilities (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial liabilities. Subsequent to initial recognition, financial liabilities are measured at amortised cost.

### **1.7.5 Impairment of Financial Assets**

Financial assets, other than those at fair value, are assessed for indicators of impairment at the end of each reporting period. Financial assets are impaired where there is objective evidence of impairment of Financial Assets (such as the probability of insolvency or significant financial difficulties of the debtor). If there is such evidence the recoverable amount is estimated and an impairment loss is recognised.

#### **Financial assets carried at amortised cost**

Financial assets are carried at amortised cost encompass accounts receivables and cash and cash equivalents. An estimate is made for doubtful debt based on past default experience of all outstanding amounts at year-end. Bad debts are written off the year in which they are identified as irrecoverable.

An allowance for impairment of accounts receivables is established when there is objective evidence that the entity will not be able to collect all amounts due according to the original terms of receivables. The allowance is made whereby the recoverability of accounts receivable is assessed individually and then collectively after grouping the assets in financial assets with similar credit risk characteristics. The amount of the allowance is the difference between the financial asset's carrying amount and the present value of estimated future cash flows, discounted at the original effective interest rate. Future cash flows in a group of financial assets that are collectively evaluated for impairment are estimated on the basis of historical loss experience for assets with credit risk characteristics similar to those in the group.

When a debtor is considered uncollectible, it is written off. Changes in the carrying amount of the allowance account are recognised in the Surplus/Deficit.

### **1.7.6 Derecognition of Financial Assets**

The entity derecognises financial assets only when the contractual rights to the cash flows from the asset expire or it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. The entity transfers a financial asset if either it transfers the contractual rights to receive the cash flows of the financial asset or retains the contractual rights to receive the cash flows of the financial asset.

### **1.7.7 Derecognition of Financial Liabilities**

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

The entity recognises the difference between the carrying amount of the financial liability (or part of a financial liability) extinguished or transferred to another party and the consideration paid, including any non-cash assets transferred or liabilities assumed, in surplus or deficit.

## 1.8 RISK MANAGEMENT OF FINANCIAL ASSETS AND LIABILITIES

It is the policy of the entity to disclose information that enables the user of its financial statements to evaluate the nature and extent of risks arising from financial instruments to which the entity is exposed on the reporting date.

The entity has exposure to the following risks from its use of financial instruments:

- market risk
- credit risk
- liquidity risk

Risks and exposure are disclosed as follows:

### Market Risk

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the entity's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

### Credit Risk

Credit risk is the risk of financial loss to the entity if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the entity's receivables from customers and investment securities.

Each class of financial instrument is disclosed separately. The maximum exposure to credit risk not covered by collateral is specified, and financial instruments covered by collateral are specified.

### Liquidity Risk

Liquidity risk is the risk that the entity will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Entity's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the entity's reputation.

Liquidity risk is managed by ensuring that all assets are reinvested at maturity at competitive interest rates in relation to cash flow requirements. Liabilities are managed by ensuring that all contractual payments are met on a timeous basis and, if required, additional new arrangements are established at competitive rates to ensure that cash flow requirements are met.

## **1.9 REVENUE RECOGNITION**

### **1.9.1 General**

Revenue, is derived from a variety of sources which includes government grants, rendering of services and finance income.

Revenue comprises the fair value of the consideration received or receivable for services rendered in the ordinary course of the entity's activities. Revenue is shown net of rebates and discounts.

The entity recognises revenue when the amount of revenue can be reliably measured, it is probable that future economic benefits will flow to the entity and when specific criteria have been met for each of the entity's activities as described below. The amount of revenue is not considered to be reliably measurable until all contingencies relating to the sale have been resolved. The entity bases its estimates on historical results, taking into consideration the type of customer, the type of transaction and the specifics of each arrangement.

### **1.9.2 Revenue from Exchange Transactions**

Revenue from exchange transactions refers to revenue that accrued to the entity directly in return for services rendered, the value of which approximates the consideration received or receivable.

#### **1.9.2.1 Finance Income**

Interest earned on investments is recognised in surplus or deficit on a time proportionate basis that takes into account the effective yield on the investment.

#### **1.9.2.2 Rendering of Services**

Rendering of Services constitute revenue which arises from service delivery to customers.

The stage of completion is assessed by reference to work performed as at the reporting date. Contract revenue includes the initial amount agreed in the contract plus any variations in contract work, claims and incentive payments to the extent that it is probable that these will result in revenue and can be measured reliably. As soon as the outcome of a contract can be estimated reliably, contract revenue and expenses are recognised in surplus or deficit in proportion to the stage of completion of the contract.

The stage of completion is assessed by reference to work performed as at reporting date. When the outcome of a contract cannot be estimated reliably, contract revenue is recognised only to the extent of contract costs incurred that are likely to be recoverable. An expected loss on a contract is recognised immediately in surplus or deficit.



### **1.9.3 Revenue from Non-exchange Transactions**

Revenue from non-exchange transactions refers to transactions where the entity received revenue from another entity without directly giving approximately equal value in exchange. Revenue from non-exchange transactions is generally recognised to the extent that the related receipt or receivable qualifies for recognition as an asset and there is no liability to repay the amount.

#### **1.9.3.1 Government Grants/Subsidies Conditional Grants and Receipts**

Income received from conditional grants, donations and funding are recognised as revenue to the extent that the entity has complied with any of the criteria, conditions or obligations embodied in the agreement. To the extent that the criteria, conditions or obligations have not been met a liability is recognised.

#### **Unconditional Grants and Receipts**

Government grants that are receivable as compensation for expenditure or losses already incurred or for the purpose of giving immediate financial support to the entity with no future related costs are recognised in surplus or deficit in the period in which they become receivable.

## **1.10 LEASES**

### **Lease Classification**

Leases of property, plant and equipment, in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases.

Leases are classified as finance leases where substantially all the risks and rewards associated with ownership of an asset are transferred to the entity.

### **The Entity as Lessee**

Determining whether an arrangement contains a lease

At inception of an arrangement, the entity determines whether such an arrangement is or contains a lease. A specific asset is the subject of a lease if fulfilment of the arrangement is dependent on the use of that specified asset. An arrangement conveys the right to use the asset if the arrangement conveys to the entity the right to control the use of the underlying asset. At inception or upon reassessment of the arrangement, the entity separates payments and other consideration required by such an arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the entity concludes for a finance lease that it is impracticable to separate the payments reliably, an asset and a liability are recognised at an amount equal to the fair value of the underlying asset. Subsequently the liability is reduced as payments are made and an imputed finance charge on the liability is recognised using the entity's incremental borrowing rate.

## **Finance Leases**

Where the entity enters into a finance lease, Property, plant and equipment or Intangible Assets subject to finance lease agreements are capitalised at amounts equal to the fair value of the leased asset or, if lower, the present value of the minimum lease payments, each determined at the inception of the lease. Corresponding liabilities are included in the Statement of Financial Position as Finance Lease Liabilities. The corresponding liabilities are initially recognised at the inception of the lease and are measured as the sum of the minimum lease payments due in terms of the lease agreement, discounted for the effect of interest. In discounting the lease payments, the entity uses the interest rate that exactly discounts the lease payments and unguaranteed residual value to the fair value of the asset plus any direct costs incurred. Lease payments are allocated between the finance cost and capital repayment using the effective interest rate method. Finance costs are expensed when incurred.

Subsequent to initial recognition, the leased assets are accounted for in accordance with the stated accounting policies applicable to property, plant, equipment or intangibles. The lease liability is reduced by the lease payments, which are allocated between finance cost and capital repayment using the effective interest rate method. Lease finance costs are expensed when incurred. The accounting policies relating to derecognition of financial instruments are applied to lease payables. The lease asset is depreciated over the shorter of the asset's useful life or the lease term.

## **Operating Leases**

The entity recognises operating lease rentals as an expenditure in surplus or deficit on a straight-line basis over the term of the relevant lease. The difference between the amounts recognised as an expenditure and the contractual payments are recognised as an operating lease asset or liability

### **1.11 RELATED PARTIES**

Individuals as well as their close family members, and/or entities are related parties if one party has the ability, directly or indirectly, to control or jointly control the other party or exercise significant influence over the other party in making financial and/or operating decisions. All entities within the national government sphere are also regarded as related parties.

### **1.12 EVENTS AFTER THE REPORTING DATE**

Events after the reporting date that are classified as adjusting events have been accounted for in the Annual Financial Statements, please refer to note 41. Events after the reporting date that are classified as non-adjusting events have been disclosed in the notes to the Annual Financial Statements.

### **1.13 COMPARATIVE INFORMATION**

#### **Prior Year Comparatives**

When the presentation or classification of items in the Annual Financial Statements is amended, prior period comparative amounts are reclassified. The nature and reasons for the reclassification is disclosed.

### **1.14 CAPITAL COMMITMENTS AND EXPENDITURE**

Items are classified as commitments where the entity commits itself to future transactions that will normally result in the outflow of resources.

Capital commitments are not recognised in the statement of financial position as a liability but are included in the disclosure notes in the following cases:

- Approved and contracted commitments, where the expenditure has been approved and the contract has been awarded at the reporting date, where disclosure is required by a specific standard of GRAP.

### **1.15 CONTINGENT LIABILITIES**

Contingent liabilities represent a possible obligation that arises from past events and whose existence will be confirmed only by an occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.

A contingent liability can also arise as a result of a present obligation that arises from past events but which is not recognised as a liability either because it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation or the amount of the obligation cannot be measured with sufficient reliability.

Contingent assets represent possible assets that arise from past events and whose existence will be confirmed only by an occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.

Contingent assets and contingent liabilities are not recognised. Contingencies are disclosed in the notes to the annual financial statements.

## **1.16 FOREIGN CURRENCIES**

Transactions in foreign currencies are initially recorded at the prevailing exchange rate on the dates of the transactions.

Monetary assets and liabilities denominated in such foreign currencies are translated to the functional currencies at the rates prevailing at the reporting date. Exchange differences are included in surplus or deficit.

### **Foreign Currency Translation**

(a) Functional and presentation currency

Items included in the financial statements are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). Financial Statements are presented in South African Rends, which is the company's functional and presentation currency.

(b) Transactions and Balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the date of the transaction. Foreign exchange gains and losses resulting from the settlement of such transactions, and from the translation of monetary assets and liabilities denominated in foreign currencies at year end are recognised in the Statement of Financial Position.

## **1.17 IRREGULAR EXPENDITURE**

Irregular expenditure is expenditure that is contrary to the Public Finance Management Act (Act No 56 of 2003) and is in contravention of any legislation. Irregular expenditure excludes unauthorised expenditure. All expenditure relating to irregular expenditure is recognised as an expense in the Statement of Financial Performance in the year that expenditure was incurred. Expenditure is classified in accordance with the nature of the expense, and where recovered, it is subsequently accounted for as revenue in the Statement of Financial Performance.

## **1.18 FRUITLESS AND WASTEFUL EXPENDITURE**

Fruitless and wasteful expenditure is expenditure that was made in vain and would have been avoided had reasonable care been exercised. Fruitless and wasteful expenditure is accounted for as expenditure in surplus or deficit.

## **1.19 EMPLOYEE BENEFITS**

### **1.19.1 Short-term Employee Benefits**

Remuneration to employees is recognised in the Statement of Financial Performance as the services are rendered, except for non-accumulating benefits, which are only recognised when the specific event occurs.

The entity treats its provision for leave pay as an accrual.

The costs of all short-term employee benefits such as leave pay and bonus are recognised during the period in which the employee renders the related service. The liability for leave pay is based on the total accrued leave days at year end and is shown as a creditor in the Statement of Financial Position. The entity recognises the expected cost of performance bonuses only when the entity has a present legal or constructive obligation to make such payment and a reliable estimate can be made.

## **1.20 PROVISIONS**

Provisions are recognised when the entity has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation and a reliable estimate can be made.

Provisions are reviewed at reporting date and the amount of a provision is the present value of the expenditure expected to be required to settle the obligation. When the effect of discounting is material, provisions are determined by discounting the expected future cash flows that reflect current market assessments of the time value of money at a rate adjusted for the specific risks of a liability. The impact of the periodic unwinding of the discount is recognised in surplus or deficit as a finance cost as it occurs.

## **1.21 INVENTORY**

The entity uses the first in first out method (FIFO) to account for inventory. Inventories are valued at the lower of cost price or net realisable value. The net realisable value is the estimated selling price in the ordinary course of business, less the estimated or selling costs.

The cost of inventories comprises of all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

The amount of any write-down of inventories to net realisable value and all losses of inventories are recognised as an expenditure in the period the write-down or loss occurs.

## **1.22 TRANSFER OF FUNCTIONS UNDER COMMON CONTROL**

If a transfer of functions between entities within the same sphere of government or between entities that are part of the same economic entity the transfer is considered to have occurred between entities under common control. Assets and liabilities transferred between entities under common control are recognised at the carrying values. In instances where the carrying amount is not available or can't be accurately determined, the depreciated replacement cost is used as the deemed carrying amount.

## **1.23 BUDGET INFORMATION**

The Financial Statements and budget are not presented on the same basis, Financial Statements are prepared on accrual basis whilst the budget is prepared on a cash basis of accounting. A reconciliation between the surplus/(deficit) for the period as per the Statement of Financial Performance and budgeted surplus/(deficit) is included in the Statement of Comparison of Budget and Actual Amounts. At the end of September each year the budget may be revised if necessary due to changes in the operations of the entity which require a reallocation of resources. All budget changes are approved by the board of directors prior to the implementation of the revised budget.

## 2. GENERAL INFORMATION

<b>Domicile</b>	South Africa
<b>Nature of business and principal activities</b>	The South African National Space Agency (SANSA) is mandated by the SANSA Act, 36 of 2008 and is South Africa's government body for the promotion and use of space. It also fosters cooperation in space-related activities and research in space science, seeks to advance scientific engineering through human capital, and supports the creation of an environment conducive to the industrial development of space technologies within the framework of national government.
<b>Legal form of entity</b>	Public entity, as defined by the Public Finance Management Act schedule 3A(Act No. 1 of 1999 as amended by Act No. 29 of 1999).
<b>Executive authority</b>	Department of Science and Technology
<b>Board members</b>	Ms. J Lawrence (Chairperson) Ms. M Matooane Prof. R Bharuthram Ms. M Mfeka Mr. V Gore Dr. N Mjoli Mr. S Hamilton Mr. A Naidoo Mr. E Jansen Mr. J Prinsloo Ms. G Khambule Mr. M Rezelman Mr. O Latiff ( Deceased September 2015) Mr. M Riba Mr. P Maine Mr. W Van Biljon Dr. S Malinga
<b>Registered office</b>	Enterprise Building, Mark Shuttleworth street, Innovation Hub Pretoria Gauteng, South Africa
<b>Business address</b>	Enterprise Building, Innovation Hub Mark Shuttleworth street, Innovation Hub Pretoria Gauteng, South Africa
<b>Postal address</b>	PO Box 484, Silverton 0127, Gauteng, South Africa
<b>Auditor</b>	Sizwe Ntsaluba Gobodo Incorporated (011) 231 0600 20 Morris Street East, Woodmead, 2191

## NOTES TO THE ANNUAL FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 March 2016

### 3. SEGMENT INFORMATION

#### **General information about segments**

The entity is organised and reports on a basis of four business units comprising of five functional areas: the corporate support programme, the Earth observation programme, the space science programme, the space operations programme and the space engineering programme. The programmes were organised around the type of services provided and the related space science fields. Management used the same segments for determining and delivering on its strategic objectives. The space engineering programme is aggregated into the corporate programme for reporting purposes. It is not an operation on its own but a business unit within the corporate programme overseeing key projects across the divisions.

The Corporate Support Programme provides management, administrative and technical support across all operating units. This facilitates operational efficiency and cost-effective management, aligned with sound governance principles and the seamless integration and collaboration between SANSA directorates.

SANSA's Space Engineering Programme leads systems engineering and project management expertise and drives a small satellite build programme in South Africa in partnership with primary contractors, R&D institutions and private sector partners. The programme conducts satellite and sub-systems analysis, leads the technical side of space programme project management, provides human capital development in space engineering and facilitates private space industry partnerships.

The Earth Observations Programme is responsible for the collection, processing, archiving and distribution of Earth observation data and data products for societal benefit. SANSA maintains an Earth observation portfolio of sensors, provides an R&D platform in Earth observation technologies, conducts satellite image processing and correction, and provides human capital development in Earth Observation and science advancement.

The Space Science Programme leads multidisciplinary space science. Key functions include fundamental and applied science research, the support of space facilitated science through science data acquisition, the coordination and administration of scientific data ground segments, provision of space weather and other geo-space products and services on a commercial and private basis. The programme also provides leadership in postgraduate student training, as well as science advancement including learner and educator support.

The Space Operations Programme is responsible for the acquisition of satellite data for the Earth Observation programme and the provision of ground segment support. Through this programme, SANSA conducts various space operations, including launch and early-orbit support, in-orbit testing, satellite life-cycle support and satellite mission control for national and international space industry clients and governments. The programme also supplies hosting capabilities and intends to extend this capability to Teleports.

### 3. SEGMENT INFORMATION (CONTINUED)

#### 3.1 2016

##### Revenue

##### Revenue from Non - Exchange Transactions

Transfers and Subsidies Received	146 721 364	47 064 068	8 367 999	30 287 643	232 441 074
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##### Revenue from Exchange Transactions

Interest Income	5 435 177	726 328	1 898 881	334 136	8 394 522
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Rendering of Services	-	20 320 424	68 023 332	8 484 872	96 828 628
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Other Income	19 489	26 507	418 671	475 141	939 808
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<b>Total Revenue</b>	<b>152 176 030</b>	<b>68 137 327</b>	<b>78 708 883</b>	<b>39 581 792</b>	<b>338 604 032</b>
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##### Expenditure

Employee Related Costs	25 055 505	21 594 546	29 682 347	19 713 778	96 046 176
------------------------	------------	------------	------------	------------	------------

Board Member Remuneration	914 270	-	-	-	914 270
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Depreciation and Amortisation	2 417 048	8 567 055	9 675 833	4 437 251	25 097 187
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Repairs and Maintenance	352 187	2 940 145	3 662 999	1 399 786	8 355 117
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Finance Costs	10 125	-	-	77	10 202
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Data Licence fees	-	31 406 738	-	-	31 406 738
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Grants and Subsidies Paid	1 161 500	258 396	-	2 202 502	3 622 398
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Antenna Infrastructure Services	-	-	4 146 811	-	4 146 811
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Training Expenses	604 532	374 216	549 830	205 224	1 733 802
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General Expenses	13 437 605	12 208 877	14 680 746	7 051 604	47 378 832
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Net Losses on foreign exchange transactions	49 839	5 274 975	79 894	65 821	5 470 529
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Loss on Disposal of Property, Plant and Equipment	-	-	14 301	1 134 770	1 149 071
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<b>Total Expenditure</b>	<b>44 002 611</b>	<b>82 624 948</b>	<b>62 492 761</b>	<b>36 210 813</b>	<b>225 331 133</b>
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<b>Surplus (Deficit) for the year</b>	<b>108 173 419</b>	<b>(14 487 621)</b>	<b>16 216 122</b>	<b>3 370 979</b>	<b>113 272 899</b>
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##### Assets

Non-current - Segment assets	150 845 958	26 841 440	70 836 910	31 072 706	279 597 014
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Current - Segment assets	98 304 310	17 386 544	77 068 505	6 638 079	199 397 438
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<b>Total Segment assets</b>	<b>249 150 268</b>	<b>44 227 984</b>	<b>147 905 415</b>	<b>37 710 785</b>	<b>478 994 452</b>
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##### Liabilities

Non - current Segment Liabilities	(32)	5 891 830	-	1	5 891 799
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Current Segment Liabilities	120 050 351	16 529 753	12 858 889	6 115 020	155 554 013
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<b>Total Segment Liabilities</b>	<b>120 050 319</b>	<b>22 421 583</b>	<b>12 858 889</b>	<b>6 115 021</b>	<b>161 445 812</b>
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### 3. SEGMENT INFORMATION (CONTINUED)

#### 3.2 2015

##### Revenue

##### Revenue from Non - Exchange Transactions

Transfers and Subsidies Received	71 022 080	64 928 017	201 600	27 434 024	163 585 721
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##### Revenue from Exchange Transactions

Interest Income	4 435 976	108 477	865 914	168 713	5 579 080
Rendering of Services	-	16 599 724	43 334 775	7 747 256	67 681 755
Other Income	284 506	16 363	177 055	190 130	668 054
Net Gains/Losses on foreign exchange transactions	(4 876)	2 351 060	(165 710)	(659)	2 179 815

##### Total Revenue

<b>75 737 686</b>	<b>84 003 641</b>	<b>44 413 634</b>	<b>35 539 464</b>	<b>239 694 425</b>
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##### Expenditure

Employee Related Costs	24 573 255	20 568 855	27 469 993	20 407 777	93 019 880
Board Member Remuneration	650 119	-	-	-	650 119
Depreciation and Amortisation	2 554 949	6 610 512	9 609 591	4 127 611	22 902 663
Impairment of Intellectual Property	1 440 000	-	-	-	1 440 000
Repairs and Maintenance	2 476 397	2 050 817	2 420 188	638 640	7 586 042
Finance Costs	29 608	-	-	20 072	49 680
Data Licence fees	-	26 723 548	-	5 475	26 729 023
Grants and Subsidies Paid	752 032	202 642	-	1 717 328	2 672 002
Antenna Infrastructure Services	-	-	1 102 997	-	1 102 997
Training Expenses	484 498	53 744	740 007	300 614	1 578 863
General Expenses	14 451 830	10 149 550	18 196 678	7 362 254	50 160 312
Loss on Disposal of Property, Plant and Equipment	19 497	-	99 580	30 694	149 771

##### Total Expenditure

<b>47 432 185</b>	<b>66 359 668</b>	<b>59 639 034</b>	<b>34 610 465</b>	<b>208 041 352</b>
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##### Surplus/Deficit for the year

<b>28 305 501</b>	<b>17 643 973</b>	<b>(15 225 400)</b>	<b>928 999</b>	<b>31 653 073</b>
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##### Assets

Non-current - Segment assets	53 588 879	32 535 147	75 373 727	31 383 679	192 881 432
Current - Segment assets	91 264 305	15 587 135	33 519 623	5 626 699	145 997 762
<b>Total Segment assets</b>	<b>144 853 184</b>	<b>48 122 282</b>	<b>108 893 350</b>	<b>37 010 378</b>	<b>338 879 194</b>

##### Liabilities

Non-current Segment Liabilities	-	9 177 630	-	-	9 177 630
Current Segment Liabilities	92 558 498	16 293 666	9 696 047	6 877 612	125 425 823
<b>Total Segment Liabilities</b>	<b>92 558 498</b>	<b>25 471 296</b>	<b>9 696 047</b>	<b>6 877 612</b>	<b>134 603 453</b>

### 3.2 Measurement of segment surplus or deficit, assets and liabilities

The accounting policies of the segments are the same as those described in the summary of the significant accounting policies.

### 3.3 Information about geographical areas

The majority of the entity's operations are in the Gauteng province, with one facility located in Hermanus in the Western Cape

	2016 R	2015 R
<b>Revenue from Non-exchange Transactions</b>		
<b>Gauteng Province</b>		
Corporate Support & Space Engineering	146 721 364	71 022 080
Earth Observation	47 064 068	64 928 017
Space Operations	8 367 999	201 600
	<b>202 153 431</b>	<b>136 151 697</b>
<b>Western Cape Province</b>		
Space Science	30 287 643	27 434 024
<b>Total Revenue from Non-exchange Transactions</b>	<b>232 441 074</b>	<b>163 585 721</b>
<b>Revenue from Exchange Transactions</b>		
<b>Gauteng Province</b>		
Corporate Support & Space Engineering	5 454 666	4 715 606
Earth Observation	21 073 259	19 075 624
Space Operations	70 340 884	44 212 034
	<b>96 868 809</b>	<b>68 003 264</b>
<b>Western Cape Province</b>		
Space Science	9 294 149	8 105 440
<b>Total Revenue from Exchange Transactions</b>	<b>106 162 958</b>	<b>76 108 704</b>

### 3. SEGMENT INFORMATION (CONTINUED)

#### Segment Expenditure

##### Gauteng Province

Corporate Support & Space Engineering

Earth Observation

Space Operations

2016

R

44 002 611

82 624 948

62 492 761

**189 120 320**

2015

R

47 432 185

66 359 668

59 639 034

**173 430 887**

##### Western Cape Province

Space Science

**36 210 813**

**34 610 465**

#### Total Segment Expenditure

**225 331 133**

**208 041 352**

#### Non - Current Segment Assets

##### Gauteng Province

Corporate Support & Space Engineering

Earth Observation

Space Operations

150 845 958

26 841 440

70 836 910

**248 524 308**

53 588 879

32 535 147

75 373 727

**161 497 753**

##### Western Cape Province

Space Science

**31 072 706**

**31 383 679**

#### Total Non - Current Segment Assets

**279 597 014**

**192 881 432**

## 4. STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS

- 4.1 The South African National Space Agency presents its approved budget on a cash basis and the financial statements on the accrual basis.
- 4.2 The budget is approved on a cash basis by functional classification as well as economic classification. The approved budget covers the fiscal period from 1 April 2015 to 31 March 2016. The budget and the accounting bases differ. The Financial Statements for the entity are prepared on the accrual basis using a classification based on the nature of expenses in the Statement of Financial Performance. The Financial Statements differ from the budget, which is approved on the cash basis. The Statement of Comparison of Budget and Actual Amounts is prepared on a comparable basis to the budget. The reconciliation of the actual comparable amounts to the net cash flows per the Cash Flow Statement is presented on the Statement of Comparison of Budget and Actual Amounts.
- 4.3 The variance between the actual and budgeted values is explained as follows:
- 4.3.1 The favourable variance on ring fenced transfers is as a result of additional transfers received from the department for the satellite programme. These funds are committed to the satellite development programme which is a multi year project and the related upgrades required on the national assembly integration and test facilities.
- 4.3.2 The unfavourable variance against budget on contract revenue from the public sector relates to funds received in advance for the placement of orders on high resolution which will be recognised to revenue once SANSA delivers the images.
- 4.3.3 The favourable variance on foreign contract income is due to additional launch support services revenue received and a cash benefit derived from the weakness of the rand against major foreign currencies during the year when foreign customers were invoiced.
- 4.3.4 The unfavourable variance is due to the budget value including an estimated foreign exchange gains from foreign client contracts. The actual benefit is realised on the invoiced value.
- 4.3.5 The variance on compensation of employees relates to vacancies during the financial year.
- 4.3.6 The variance on goods and services consists of items on order not yet delivered, which normally have long lead times.
- 4.3.7 Most of the equipment is sourced internationally for both the ground infrastructure and research equipment. There are currently items on order that are expected to be received in the next financial year.
- 4.3.8 The variance on software and intangible assets relates to the commitment on the acquisition of the ERP system and its implementation over the two financial years to March 2017. There was a slight delay in the start of the project implementation
- 4.3.9 The satellite programme is a multi year project expected to end in 2018 and the variance against budget reflects some delays in the project, due to some of the support structures such as the assembly integration and testing facilities which are critical to the project requiring upgrading, but not funded. The funds are committed to the full project.

## 5. CASH AND CASH EQUIVALENTS

	<b>2016</b> <b>R</b>	<b>2015</b> <b>R</b>
Cash and Cash Equivalents	178 458 539	123 228 549
<b>Total Cash and Cash Equivalents</b>	<b>178 458 539</b>	<b>123 228 549</b>

Cash and cash equivalents are measured at amortised cost. Cash includes cash on hand and cash with banks.

### 5.1 Bank Accounts

Cash in Bank for operational requirements	74 030 553	34 073 413
Cash in the bank held on behalf of Principal	22 083 483	-
Cash in bank held for committed conditional grant	82 335 930	89 146 354
<b>Total Bank Accounts</b>	<b>178 449 966</b>	<b>123 219 767</b>

Cash held for operational requirements represents cash to be utilised to settle trade and other payables R38m (2015: R25m), provisions R6.9m (2015: R6.1m), finance lease liabilities R11.7m (2015: R13.9m) and the outstanding balance is to be used to cover expenditure commitments on order, but not yet delivered by year end.

Cash held on behalf of the Principal is to be utilised to pay for expenditures incurred mainly focused on the retention of the core capability for the satellite engineering, through an incentive payable to former Sunspace employees payable over a period of three years and the upgrade of the assembly, integration and testing facilities. Transfers were mainly to Denel who are the custodians of the facilities and have absorbed the former Sunspace employees, as referred to in note 18.

Cash in the bank held for committed conditional grants and held on behalf of principal are to cover the following future liabilities:

Ring Fenced Grants consisting of R4.5m (2015: R4.5m) for the NRF HCD Grant; R0.89m (2015: R0.89m), Sunspace (Transition balance remaining) R73m (2015: R82m) for the Satellite Development project; R22m (2015: - R2.5) for Satellite Engineering Industry Upgrade; R 2.4m (2015: nil) for Human Capital Development Grant; R 2.2m (2015:R3m) for Research Grants.

### 5.2 Cash on hand

Cash on hand	8 573	8 782
<b>Total Cash and cash equivalents</b>	<b>178 458 539</b>	<b>123 228 549</b>

## 6. RECEIVABLES FROM EXCHANGE TRANSACTIONS

	2016 R	2015 R
Trade receivables from exchange transactions	18 046 991	17 443 498
	<b>18 046 991</b>	<b>17 443 498</b>

### 6.1 Trade receivables from exchange transactions

	Gross Balances	Allowance for Impairment	Net Balances
<b>As at 31 March 2016</b>			
Trade customers	18 046 991	-	18 046 991
<b>Total</b>	<b>18 046 991</b>	<b>-</b>	<b>18 046 991</b>

	Gross Balances	Allowance for Impairment	Net Balances
<b>As at 31 March 2015</b>			
Trade customers	17 443 498	-	17 443 498
<b>Total</b>	<b>17 443 498</b>	<b>-</b>	<b>17 443 498</b>

### 6.1.2 Ageing of Trade receivables from exchange transactions

	2016 R	2015 R
<i>Current:</i>		
0 - 30 days	17 206 194	17 036 649
<i>Past Due:</i>		
31 - 60 Days	433 146	401 049
61 - 90 Days	172 546	5 800
91 - 120 Days	235 105	-
<b>Total</b>	<b>18 046 991</b>	<b>17 443 498</b>

### 6.1.3 Reconciliation of the allowance for Impairment

	2016 R	2015 R
Balance at beginning of year	-	(17 594)
Impairment Losses recognised		
Impairment Losses reversed	-	17 594
Amounts recovered		-
<b>Balance at end of year</b>	<b>-</b>	<b>-</b>

In determining the recoverability of debtors, the allowance for impairment of trade receivables has been made for all customer balances outstanding. No further credit allowance is required in excess of allowance for Impairment.

Financial assets that are neither past due nor impaired are considered to be fully performing. The carrying amounts of fully performing financial assets included in trade and receivables at year-end are:

17 206 194	17 036 649
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Financial assets included in trade receivables that are outside their normal payment terms are considered to be past due. The following represents an analysis of the past due financial assets that are past due but not impaired:

840 797	406 849
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Receivables from Local debtors	9 681 652	14 697 590
Receivables from International debtors	8 365 339	2 745 908
<b>Total Trade Debtors</b>	<b>18 046 991</b>	<b>17 443 498</b>

#### 6.1.4 Credit quality of trade receivables from exchange transactions

Trade receivables consist of a large number of customers, spread across different industries in the geographical area of the entity. Periodic credit evaluation is performed on the financial condition of accounts receivable and, where appropriate, credit guarantee is increased accordingly. Trade receivables are non-interest bearing and are generally on 30 day collection terms. The maximum exposure to credit risk at the reporting date is the amortised cost of each class of receivable mentioned above.

In determining the recoverability of a receivable, management considers any change in the credit quality of the debtor from the date credit was initially granted up to the reporting date. Any allowance for impairment on trade and other receivables (loans and receivables) exists predominantly due to the possibility that these debts will not be recovered. Management assesses these debtors individually for impairment and group them together in the Statement of Financial Position as financial assets with similar credit risk characteristics.

The credit quality of trade receivables that are neither past due nor impaired are considered fair by the company taking into account the historical information available.

#### 6.1.5 Fair value of trade receivables from exchange transactions

Trade and other receivables from exchange transactions (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset. Subsequent to initial recognition, financial assets are measured at amortised cost.

Management considers the carrying amounts of financial assets recorded at amortised cost in the financial statements to approximate their fair values on 31 March 2015, as a result of the short-term maturity of these assets and liabilities.

#### 6.1.6 Classification of financial assets

Financial Assets of the entity are classified as follows:

##### Financial Assets

##### Classification

##### **Trade receivables from exchange transactions**

Trade receivables

At amortised cost



## 6.2 RECEIVABLES FROM NON-EXCHANGE TRANSACTIONS

	<b>2016</b>	<b>2015</b>
	<b>R</b>	<b>R</b>
Receivables from non-exchange transactions	2 540 088	2 407 214
	<b>2 540 088</b>	<b>2 407 214</b>

### 6.2.1 Receivables from non-exchange transactions

#### As at 31 March 2016

	<b>Gross Balances</b>	<b>Allowance for Impairment</b>	<b>Net Balances</b>
Prepaid expenses	527 399	-	527 399
Sundry deposits	1 988 908	-	1 988 908
Other Debtors	23 781	-	23 781
<b>Total</b>	<b>2 540 088</b>	<b>-</b>	<b>2 540 088</b>

#### As at 31 March 2015

	<b>Gross Balances</b>	<b>Allowance for Impairment</b>	<b>Net Balances</b>
Prepaid expenses	826 755	-	826 755
Sundry deposits	1 548 170	-	1 548 170
Other Debtors	32 289	-	32 289
<b>Total</b>	<b>2 407 214</b>	<b>-</b>	<b>2 407 214</b>

### 6.2.2 Credit quality of Receivables from non-exchange transactions

Periodic credit evaluation is performed on the financial condition of accounts receivable and, where appropriate, credit guarantee is increased accordingly. Trade receivables are non-interest bearing. The maximum exposure to credit risk at the reporting date is the fair value of each class of receivable mentioned above.

In determining the recoverability of a receivable, management considers any change in the credit quality of the debtor from the date credit was initially granted up to the reporting date. Any allowance for impairment on trade and other receivables (loans and receivables) exists predominantly due to the possibility that these debts will not be recovered. Management assesses these debtors individually for impairment and group them together in the Statement of Financial Position as financial assets with similar credit risk characteristics.

The credit quality of trade receivables from non-exchange that are neither past due nor impaired are considered fair by the company taking into account the historical information available.

### 6.2.3 Fair value of Receivables from non-exchange transactions

Trade and other receivables from non-exchange transactions (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset. Subsequent to initial recognition, financial assets are measured at amortised cost.

Management considers the carrying amounts of financial assets recorded at amortised cost in the financial statements to approximate their fair values on 31 March 2016, as a result of the short-term maturity of these assets and liabilities.

### 6.2.4 Classification of financial assets

The Financial Assets of the entity are classified as follows:

#### Financial Assets

#### Classification

#### **Receivables from non-exchange transactions**

Sundry deposits

At amortised cost

Other Debtors

At amortised cost

7. INVENTORY  
Fuel - at cost  
**Total Inventory**

2016 R	2015 R
351 820	335 411
<b>351 820</b>	<b>335 411</b>

## NOTES TO THE ANNUAL FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2016

### 8. PROPERTY, PLANT AND EQUIPMENT

31 March 2016

#### Reconciliation of Carrying Value

Description	Land	Leasehold Improvements	Leased Assets	Buildings	Plant and Machinery	Research Equipment
	R	R	R	R	R	R
<b>Carrying values at 1 April 2015</b>	<b>4 307 700</b>	<b>622 785</b>	<b>80 004</b>	<b>12 696 653</b>	<b>64 651 220</b>	<b>10 415 141</b>
Cost	4 307 700	1 700 946	328 387	14 230 505	88 867 053	16 823 783
Completed Assets	4 307 700	1 700 946	328 387	14 230 505	88 867 053	16 823 783
Under Construction	-	-	-	-	-	-
Accumulated Depreciation:	-	(1 078 161)	(248 383)	(1 533 852)	(24 215 833)	(6 408 640)
Acquisitions at Cost	-	-	-	-	3 104 783	1 197 676
Capital under Construction - Additions	-	-	-	-	-	-
Depreciation	-	(563 987)	(79 786)	(444 408)	(7 387 331)	(2 418 725)
Carrying Value of Disposals:	-	-	-	-	(14 165)	(453 292)
Cost of Disposed Asset	-	-	-	-	(14 505)	(881 241)
Cost - Reversal of prior year incorrect disclosure 1	-	-	-	-	(93 736)	-
Accumulated Depreciation of Disposed Asset	-	-	-	-	340	427 949
Accumulated Depreciation - Reversal of prior year incorrect disclosure 1	-	-	-	-	93 736	-
CAPITALISED AMOUNTS	-	-	-	-	-	-
Impairment Losses	-	-	-	-	-	-
<b>Carrying values at 31 March 2016</b>	<b>4 307 700</b>	<b>58 798</b>	<b>218</b>	<b>12 252 245</b>	<b>60 354 508</b>	<b>8 740 801</b>
Cost	4 307 700	1 700 946	328 387	14 230 505	91 863 596	17 140 218
- Completed Assets	4 307 700	1 700 946	328 387	14 230 505	91 863 596	17 140 218
- Under Construction	-	-	-	-	-	-
<b>Accumulated Depreciation:</b>	<b>-</b>	<b>(1 642 148)</b>	<b>(328 169)</b>	<b>(1 978 260)</b>	<b>(31 509 088)</b>	<b>(8 399 417)</b>

<sup>1</sup> - During the 2014/15 financial year closing balances disclosure on Property, Plant and Equipment for both cost and accumulated depreciation were overstated as follows: Plant and Machinery R93 736, Office Equipment R96 336, and Furniture and Fittings R9 700.00. The error had no impact on the Net Book Value disclosed and does not present any errors in the financial results of SANSA as the error only affected amounts disclosed. The Trial Balance agreed to the Fixed Asset Register however amounts disclosed on the Annual Financial Statements did not agree to both the Trial Balance and the Fixed Assets Register.

Vehicles	Office Equipment	Furniture and Fittings	Computer Equipment	Exhibits	Work In Progress	Laboratory Equipment	Total
R	R	R	R	R	R	R	R
<b>4 974 688</b>	<b>3 482 797</b>	<b>3 135 555</b>	<b>11 233 148</b>	<b>288 342</b>	<b>48 284 527</b>	<b>658 459</b>	<b>164 831 024</b>
6 774 703	9 096 568	4 648 928	26 502 858	364 800	48 284 527	811 586	222 742 345
6 774 703	9 096 568	4 648 928	26 502 858	364 800	-	811 587	174 457 819
-	-	-	-	-	48 284 527	-	48 284 527
(1 800 015)	(5 613 771)	(1 513 374)	(15 269 711)	(76 458)	-	(153 128)	(57 911 326)
829 839	289 988	242 440	7 415 902	24 000	99 085 095	1 163 418	14 268 046
(498 628)	(534 451)	(475 425)	(4 797 875)	(37 910)	-	(255 632)	(17 494 158)
(523 435)	(671 400)	(34 264)	(23 590)	-	-	-	(1 720 146)
(640 009)	(1 245 996)	(67 686)	(297 209)	-	-	-	(3 146 646)
116 574	(96 336)	(9 700)	273 619	-	-	-	(199 772)
-	574 596	33 422	-	-	-	-	1 426 500
-	96 336	9 700	-	-	(1 088 273)	-	199 772
-	-	-	-	-	-	-	(1 088 273)
<b>4 782 465</b>	<b>2 566 935</b>	<b>2 868 305</b>	<b>13 827 586</b>	<b>274 432</b>	<b>146 281 349</b>	<b>1 566 245</b>	<b>257 881 588</b>
6 964 535	8 044 225	4 813 983	33 621 553	388 800	146 281 349	1 975 005	331 660 802
6 964 535	8 044 225	4 813 983	33 621 553	388 800	-	1 975 005	185 379 453
-	-	-	-	-	146 281 349	-	146 281 349
<b>(2 182 070)</b>	<b>(5 477 290)</b>	<b>(1 945 678)</b>	<b>(19 793 967)</b>	<b>(114 368)</b>	<b>-</b>	<b>(408 760)</b>	<b>(73 779 215)</b>

## 8. PROPERTY, PLANT AND EQUIPMENT (Continued)

31 March 2015

### Reconciliation of Carrying Value

Description	Land	Leasehold	Leased Assets	Buildings	Plant	Research
	R	Improvements		R	R	R
	R	R	R	R	R	R
<b>Carrying values at 1 April 2014</b>	<b>4 307 700</b>	<b>1 116 586</b>	<b>167 696</b>	<b>13 138 381</b>	<b>56 840 644</b>	<b>12 375 180</b>
Cost	4 307 700	1 644 434	328 387	14 227 825	73 542 262	16 432 893
Completed Assets	4 307 700	1 644 434	328 387	14 227 825	73 542 262	16 432 893
Under Construction	-	-	-	-	-	-
Accumulated Depreciation:	-	(527 848)	(160 691)	(1 089 444)	(16 701 618)	(4 057 713)
Acquisitions at Cost	-	56 512	-	2 680	13 897 790	390 888
Capital under Construction - Additions	-	-	-	-	1 427 001	-
Depreciation	-	(550 312)	(87 692)	(444 408)	(7 514 215)	(2 350 927)
Carrying value of Disposals:	-	-	-	-	-	-
Cost of Disposed Asset	-	-	-	-	-	-
Accumulated Dep of Disposed Asset	-	-	-	-	-	-
Accumulated Dep of Useful Life Adjustments	-	-	-	-	-	-
<b>CAPITALISED AMOUNTS</b>						
Impairment Losses	-	-	-	-	-	-
<b>Carrying values at 1 April 2015</b>	<b>4 307 700</b>	<b>622 785</b>	<b>80 004</b>	<b>12 696 653</b>	<b>64 651 220</b>	<b>10 415 141</b>
Cost	4 307 700	1 700 946	328 387	14 230 505	88 867 053	16 823 782
Completed Assets	4 307 700	1 700 946	328 387	14 230 505	88 867 053	16 823 782
Under Construction	-	-	-	-	-	-
Accumulated Depreciation:	-	(1 078 160)	(248 383)	(1 533 852)	(24 215 833)	(6 408 640)

Vehicles	Office Equipment	Furniture and Fittings	Computer Equipment	Exhibits	Work In Progress	Laboratory Equipment	Total
R	R	R	R	R	R	R	R
<b>5 169 826</b>	<b>3 593 109</b>	<b>3 496 656</b>	<b>9 301 668</b>	<b>324 822</b>	<b>13 683 831</b>	<b>217 662</b>	<b>123 733 763</b>
6 403 445	8 615 750	4 559 464	22 172 695	364 800	13 683 831	235 011	166 518 497
6 403 445	8 615 750	4 559 464	22 172 695	364 800	-	235 011	152 834 667
-	-	-	-	-	13 683 831	-	13 683 831
(1 233 618)	(5 022 641)	(1 062 808)	(12 871 027)	(39 978)	-	(17 349)	(42 784 736)
510 196	525 520	134 376	5 666 123	-	-	576 577	21 760 661
-	-	-	-	-	36 027 697	-	37 454 698
(613 135)	(631 973)	(471 074)	(3 601 578)	(36 480)	-	(135 779)	(16 437 574)
(92 200)	(3 859)	(24 403)	(133 065)	-	-	-	(253 526)
(138 938)	(44 702)	(44 911)	(1 335 960)	-	-	-	-
46 738	40 843	20 509	1 202 895	-	-	-	-
-	-	-	-	-	(1 427 001)	-	(1 427 001)
-	-	-	-	-	-	-	-
<b>4 974 688</b>	<b>3 482 797</b>	<b>3 135 555</b>	<b>11 233 148</b>	<b>288 342</b>	<b>48 284 527</b>	<b>658 459</b>	<b>164 831 024</b>
6 774 703	9 096 568	4 648 928	26 502 858	364 800	48 284 527	811 587	222 742 345
6 774 703	9 096 568	4 648 928	26 502 858	364 800	-	811 587	174 457 818
-	-	-	-	-	48 284 527	-	48 284 527
(1 800 015)	(5 613 771)	(1 513 374)	(15 269 711)	(76 458)	-	(153 128)	(57 911 326)

## 8. PROPERTY, PLANT AND EQUIPMENT (CONTINUED)

### 8.1 Fully depreciated items still in use

Number of fully depreciated assets that is still in use

	2016	2015
	R	R
	458	716

### 8.2 Assets given as security

No assets were given as security.

### 8.3 Change in estimate

During the year the following changes were made to the estimations employed in the accounting for asset transactions:

Change in depreciation resulting from reassessment of useful lives, affecting the following categories:

	Value derived using the original estimate	Value derived using amended estimate	Value impact of change in estimate
	R	R	R
Computer Equipment	481 776	300 086	(181 690)
Computer Software	598 315	341 595	(256 720)
Office Equipment	27 772	15 354	(12 418)
Office Furniture	1 009	3 305	2 296
Plant and Machinery	1 363 864	588 066	(775 798)
Research Equipment	87 423	66 595	(20 828)
Vehicles	495 870	461 132	(34 738)
<b>Total</b>	<b>3 056 029</b>	<b>1 776 133</b>	<b>(1 279 896)</b>





## 9. INTANGIBLE ASSETS (CONTINUED)

31 March 2015

### Carrying values at 01 April 2014

	Intellectual Property	Computer Software	Total
Cost	2 800 000	5 972 400	8 772 400
Accumulated Amortisation	-	(2 487 221)	(2 487 221)
Acquisitions during the Year:	-	<b>29 672 564</b>	<b>29 672 564</b>
Purchased	-	29 672 564	29 672 564
Transfers from work in progress	-	-	-
Disposal during the Year:	-	<b>(2 246)</b>	<b>(2 246)</b>
Cost of Disposed Asset	-	(20 210)	(20 210)
Accumulated Dep of Disposed Asset	-	17 965	17 965
Impairment during the year	(1 440 000)	-	(1 440 000)
Amortisation during the Year:	(560 000)	(5 905 089)	(6 465 089)

### Carrying values at 31 March 2015

Cost	2 800 000	35 624 753	38 424 753
Accumulated Impairment	(1 440 000)	-	(1 440 000)
Accumulated Amortisation	(560 000)	(8 374 346)	(8 934 346)

## 10. TRADE AND OTHER PAYABLES FROM EXCHANGE TRANSACTIONS

	2016 R	2015 R
Trade Creditors	10 432 582	4 395 011
Other Creditors	85 148	1 512 898
Income received in advance	10 151 836	6 756 500
Accrued Expenses	10 633 730	5 125 788
Accrued leave	6 312 739	6 608 871
13th Cheque	665 125	594 589
Other Provisions	-	201 360
<b>Total Creditors</b>	<b>38 281 160</b>	<b>25 195 017</b>

## 10. TRADE AND OTHER PAYABLES FROM EXCHANGE TRANSACTIONS (Continued)

The average credit period on purchases is 30 days from the receipt of the invoice, as determined by the accounting policy.

No interest is charged for the first 30 days from the date of receipt of the invoice. Thereafter interest is charged in accordance with the credit policies of the various individual creditors that the entity deals with. The entity has financial risk policies in place to ensure that all payables are paid within the credit timeframe.

Leave accrues to the staff of the entity on an monthly basis, subject to certain conditions. The accrual is an estimate of the amount due at the reporting date. Employees may not accumulate more than 50 leave days at any given time and may not roll forward leave for a period of more than 6 months after year end.

### 10.1 Credit terms of trade and other payables

Trade payables are non-interest bearing and are generally on 30 day payment terms. The entity does not pledge any of its assets as security for the payables. The entity has internal operating procedures and controls in place to ensure that all payables are paid within the credit timeframe.

### 10.2 Classification of financial liabilities

The Financial Liabilities of the entity is classified as follows:

#### **Financial Liabilities**

##### **Trade and other payables**

Trade Creditors

Other Creditors

Accrued Expenses

#### **Classification**

Financial liabilities at amortised cost

Financial liabilities at amortised cost

Financial liabilities at amortised cost

## 11 PROVISIONS

Bonus Provision

### Total Provisions

	2016 R	2015 R
Bonus Provision	6 961 610	6 160 602
<b>Total Provisions</b>	<b>6 961 610</b>	<b>6 160 602</b>

The bonus provision represents the estimated liability in respect of performance bonuses to be paid out to employees.

The movement in current provisions is reconciled as follows:

### Provisions:

Balance at beginning of year

Reversal of prior year (unutilised)/under estimated provision

Contributions to provision

Amount utilised during the year

### Balance at end of year

Balance at beginning of year	6 160 602	5 123 482
Reversal of prior year (unutilised)/under estimated provision	(1 390 437)	9 335
Contributions to provision	6 961 610	6 160 602
Amount utilised during the year	(4 770 165)	(5 132 817)
<b>Balance at end of year</b>	<b>6 961 610</b>	<b>6 160 602</b>

## 12 COMMITTED CONDITIONAL GRANT

### 12.1 Conditional Grants from Government

National Government Grants

### Total Conditional Grants and Receipts

	2016 R	2015 R
National Government Grants	82 335 930	89 146 354
<b>Total Conditional Grants and Receipts</b>	<b>82 335 930</b>	<b>89 146 354</b>

### Conditional Grant Liabilities is made up of the following Grants:

Ring Fenced Grants

NRF HCD

Sunspace (Transition)

Satellite Development

Human Capital Development grant

Research and Development grant

Ring Fenced Grants		
NRF HCD	4 466 806	4 466 806
Sunspace (Transition)	89 000	89 000
Satellite Development	73 077 888	81 544 694
Human Capital Development grant	2 463 799	-
Research and Development grant	2 238 437	3 045 854
	<b>82 335 930</b>	<b>89 146 354</b>

Refer to Note 17 (Transfers and subsidies received) for a reconciliation of the grants received, recognised as revenue and committed as at year end.

### 13 LONGTERM LIABILITY

Current Portion -Long Term Liability  
 Non -Current Portion -Long Term Liability

#### Total Long Term Liability

	2016 R	2015 R
	5 891 830	4 588 815
	5 891 799	9 177 630
<b>Total Long Term Liability</b>	<b>11 783 629</b>	<b>13 766 445</b>

The SPOT Telemetry was acquired at a cost of EUR 4.2m (R30m), EUR 1.75m is payable bi-annually over a five year period from 1 October 2013 until 1 October 2017, the payable fee includes maintenance fee.

### 14 FINANCE LEASE LIABILITIES RELATING TO OFFICE EQUIPMENT

Finance Leases relate to the leasing of office equipment with lease terms of between 3-5years. This office equipment has been accounted for in Property Plant and Equipment under the asset category leased assets. The average internal rate of return rate on finance leases is 18% (2015: 18%).

The fair value of Finance leases was determined after considering the standard terms and conditions of agreements entered into between the entity and the relevant financing institutions.

#### The entity as Lessee:

Management of the entity is of the opinion that the carrying value of long-term liabilities recorded at amortised cost in the Annual Financial Statements approximate their fair values.

The obligations under finance leases are as follows:

	Minimum Lease Payments		Present Value of Minimum Lease Payments	
	2016 R	2015 R	2016 R	2015 R
<b>Amounts payable under finance leases:</b>				
Within one year	-	113 224	-	102 992
In the second to fifth years	-	-	-	-
Over five years	-	-	-	-
	-	113 224	-	102 992
Less: Future Finance Obligations	-	(10 201)	-	-
<b>Present Value of Minimum Lease Obligations</b>	-	103 022	-	102 992
Less: Amounts due for settlement within 12 months (Current Portion)	-	-	-	(102 992)
<b>Finance Lease Obligations due for settlement after 12 months (Non-current Portion)</b>	-	-	-	-

## 14 FINANCE LEASE LIABILITIES RELATING TO OFFICE EQUIPMENT (Continued)

The entity has finance lease agreements for the following significant classes of assets:

- Office Equipment

PABX Ericsson

• Instalments are payable monthly in advance	-
• Average period outstanding	-
• Average effective interest rate, based on internal rate of return	11,57%
• Average monthly instalment	R 2 710,92

Minolta Copier 1

• Instalments are payable monthly in advance	-
• Average period outstanding	-
• Average effective interest rate	20,17%
• Average monthly instalment	R 3 266,72

Minolta Copier 2

• Instalments are payable monthly in advance	-
• Average period outstanding	-
• Average effective interest rate, based on internal rate of return	20,17%
• Average monthly instalment	R 3 266,72

Minolta Copier 3

• Instalments are payable monthly in advance	-
• Average period outstanding	-
• Average effective interest rate, based on internal rate of return	20,17%
• Average monthly instalment	R 3 266,72

#### 14.1 Operating lease liability

Operating Leases are recognised on the straight-line basis as per the requirements of GRAP 13. In respect of Non-cancellable Operating Leases the following liabilities have been recognised:

	2016 R	2015 R
Balance at beginning of year	232 043	397 873
Operating lease liability during the period	(232 043)	(165 830)
<b>Total Operating Lease</b>	<b>-</b>	<b>232 043</b>

#### 14.1.1 Amounts payable under Operating Leases

At the reporting date the entity had outstanding commitments under non-cancellable operating leases, which fall due as follows:

Up to 1 year	<b>782 720</b>	<b>2 089 147</b>
Buildings	742 594	2 053 018
Office equipment	40 126	36 129
Vehicles	-	-
<b>2 to 5 years</b>	<b>67 338</b>	<b>10 497</b>
Buildings	-	-
Office equipment	67 338	10 497
Vehicles	-	-
More than 5 years	-	-
Buildings	-	-
Office equipment	-	-
Vehicles	-	-
<b>Total Operating Lease Arrangements</b>	<b>850 058</b>	<b>2 099 644</b>

The entity has operating lease agreements for the following classes of assets, which are only significant collectively:

- Buildings
- Office Equipment

No restrictions have been imposed on the entity in terms of the operating lease agreements.

## 15 ACCUMULATED SURPLUS

The Accumulated Surplus consists of:

Accumulated Surplus

### Total Accumulated Surplus

	2016 R	2015 R
Accumulated Surplus	317 548 640	204 275 741
<b>Total Accumulated Surplus</b>	<b>317 548 640</b>	<b>204 275 741</b>

Accumulated Surplus represents residual interest in the assets of the entity after deducting all its liabilities. This is mainly made up of the Net Book Value of Non-current assets of R279m (2015:R192m), which in their nature will depreciate over a longer term, as SANSA will continue to derive economic benefits from an investment in these assets. The summarised values of these assets are: Land and Buildings R16.5m (2015: R16.9m); Plant and Machinery R60.4m (2015: R64m); Work in Progress (Satellite Development) R146m (2015: 48m); Research Equipment R8.7m (2015: R10m); Other assets R25.3 (2015: R23.4) and Intangible assets R21.7m (2015: R28m). The balance relates to committed funds generated during the financial year, which are committed to expense items that are on order, but not yet received and thus not recorded as expenditures.

Refer to Statement of Changes in Net Assets for more detail and the movement on Accumulated Surplus.

## 16 INTEREST INCOME

### External Investments:

Bank Account

Bank Account	8 394 522	5 579 080
	<b>8 394 522</b>	<b>5 579 080</b>

## 17 TRANSFERS AND SUBSIDIES RECEIVED

### Operational Grants:

Parliamentary Grants (DST)

	<b>124 355 000</b>	<b>118 298 000</b>
Parliamentary Grants (DST)	124 355 000	118 298 000

Transferred from Deferred Revenue

	<b>108 086 074</b>	<b>45 287 721</b>
Transferred from Deferred Revenue	108 086 074	45 287 721

### Total Government Grants and Subsidies

	<b>232 441 074</b>	<b>163 585 721</b>
--	--------------------	--------------------



	2016 R	2015 R
<b>17.1 Ring Fenced Grants</b>		
<b>Total</b>		
Balance unspent at beginning of year	86 100 500	73 264 981
Balance unspent at beginning of year adjusted by separate disclosure of principal (note 18)		(15 167 444)
Current year receipts	91 386 000	70 000 000
Conditions met - transferred to Revenue	(99 852 806)	(59 747 571)
Conditions met - transferred to Revenue adjusted by separate disclosure of principal (note 18)	-	17 750 534
Conditions still to be met - transferred to Liabilities (see note 12)	<b>77 633 694</b>	<b>86 100 500</b>

See the breakdown of this grant with the descriptions for each component below:

#### 17.1.1 SAEON & NRF

Balance unspent at beginning of year	4 466 806	6 484 806
Current year receipts	-	-
Conditions met - transferred to Revenue		(2 018 000)
Conditions still to be met - transferred to Liabilities	<b>4 466 806</b>	<b>4 466 806</b>

These ring fenced grants received from the DST for projects related to Sunspace: SAEON (South African Environmental Observation Network); for the development of the South African Earth Observation System Portal and NRF (National Research Foundation): for Human Capital Development Initiatives. These projects were ceded to SANSA and are currently being finalised.

#### 17.1.2 Sunspace (Transition)

Balance unspent at beginning of year	89 000	89 000
Current year receipts	-	-
Conditions met - transferred to Revenue	-	-
Conditions still to be met - transferred to Liabilities	<b>89 000</b>	<b>89 000</b>

Sunspace Transition: for the Transition Phase for Sunspace Core Capabilities Absorption Process Work Packages. This project has been concluded.

### 17.1.3 Satellite Development

	2016	2015
	R	R
Balance unspent at beginning of year	81 544 694	51 523 731
Current year receipts	91 386 000	70 000 000
Conditions met - transferred to Revenue	(99 852 806)	(39 979 037)
Conditions still to be met - transferred to Liabilities	<b>73 077 888</b>	<b>81 544 694</b>

The satellite development project is a multi year project funded through a grant from DST. SANSa has a current contractual commitment with Denel for the development of the satellite. The current remaining contract value for the satellite build project is R311 million which is disclosed under note 33: Commitments for expenditure. The project is estimated to be completed in 2018/19.

### 17.2 Human Capital Development

Balance unspent at beginning of year	-	-
Current year receipts	3 736 000	-
Conditions met - transferred to Revenue	(1 272 201)	-
Conditions still to be met - transferred to Liabilities (see Note 12)	<b>2 463 799</b>	-

### 17.3 Research and Development grants

#### Total

Balance unspent at beginning of year	3 045 854	2 367 065
Current year receipts	6 393 869	2 852 639
Current year refunds	(240 575)	-
Conditions met - transferred to Revenue	(6 960 711)	(2 173 850)
Conditions still to be met - transferred to Liabilities (see Note 12)	<b>2 238 437</b>	<b>3 045 854</b>

These grants are for multiple purposes which include research infrastructure grants as well as student bursaries linked to research projects. The research project grants include running expenses and travel funds as well. The grants were received from the National Research Foundation (NRF) by particular researchers after successful application to a competitive programme. Some of the grants were purely mobility grants. All of the grants are multiple year awards and are on-going until the project is completed.

## 18 LIABILITY HELD ON BEHALF OF PRINCIPAL

	2016 R	2015 R
Balance unspent at beginning of year	(2 583 090)	15 167 444
Current year receipts	58 892 000	-
Cash utilised in the current year	(34 225 427)	(17 750 534)
Unutilised cash in the current year	<b>22 083 483</b>	<b>(2 583 090)</b>

SANSA received funding to stimulate the local space industry, which is mainly focused on the retention of the core capability for the satellite engineering, through an incentive payable to former Sunspace employees payable over three years and the upgrade of the assembly, integration and testing facilities. Transfers were mainly to Denel who are the custodians of the facilities and have absorbed the former Sunspace employees.

In the prior year SANSA used an amount of R2.5m to fund the activities of the principal, the amount was recovered during the current year.

Financial risks associated with the relationship is in relation to cash flow where the principal obligations for the year might be above the current cash available, however the risk is minimised by the fact that cash allocation for SANSA's operational requirements and project requirements are all funded by the Department of Science and Technology (DST).

The non financial risk is that by using SANSA as an agent, for the above transaction DST is in fact giving SANSA the oversight role and thus SANSA will be held liable for delivery on the project.

## 19 OTHER INCOME

Sundry Income	560 535	189 223
Project Revenue	199 750	-
Rent Received	2 217	164 800
Discount Received	26 507	5 785
Donation	-	6 287
Expense Recovery	92 719	199 415
Insurance pay-out	58 080	102 544
<b>Total Other Income</b>	<b>939 808</b>	<b>668 054</b>

## 20 EMPLOYEE RELATED COSTS

	2016 R	2015 R
Employee Related Costs - Salaries and Wages	79 458 910	78 740 703
Contributions to UIF, Workman Compensation and Pension Funds	7 509 897	6 143 026
Remote location allowance	3 088 170	2 947 500
Cell Phone Allowance	418 026	414 947
Performance Bonuses current year adjustment	5 571 173	4 773 704
<b>Total Employee Related Costs</b>	<b>96 046 176</b>	<b>93 019 880</b>

The members of key management personnel of SANSA during the year were:

- Chief Executive Officer - Dr. S Malinga
- Chief Financial Officer - Ms. B Pono
- Executive Director Corporate Services - Mr. Z Ndziba
- Executive Director Space Engineering - Mr. A Khatri
- Managing Director SANSA Space Operations - Mr. R Hodges
- Managing Director SANSA Earth Observation - Dr. J Olwoch
- Managing Director SANSA Space Science - Dr. L McKinnell

### Remuneration of the Chief Executive Officer: Dr. S Malinga

Annual Remuneration	1 720 906	1 609 486
Performance Bonus	109 109	102 103
Contributions to UIF, Medical, cellphones and Pension Funds	163 590	154 075
<b>Total</b>	<b>1 993 605</b>	<b>1 865 664</b>

### Remuneration of the Chief Financial Officer: Ms. B Pono

Annual Remuneration	1 347 991	1 237 807
Performance Bonus	84 590	79 204
Car and Travel Allowance	-	22 000
Contributions to UIF, Medical, cellphones and Pension Funds	110 249	103 695
<b>Total</b>	<b>1 542 830</b>	<b>1 442 706</b>

## 20 EMPLOYEE RELATED COSTS (Continued)

### Remuneration of the Executive Director: Mr. Z Ndziba

	2016 R	2015 R
Annual Remuneration	1 135 776	1 053 465
Performance Bonus	79 145	74 106
Car and Travel Allowance	212 850	212 850
Contributions to UIF, Medical, cellphones and Pension Funds	10 065	10 655
<b>Total</b>	<b>1 437 836</b>	<b>1 351 076</b>

### Remuneration of the Executive Director: Mr. A. Khatri

Annual Remuneration	856 255	-
Contributions to UIF, Medical, cellphones and Pension Funds	75 396	-
<b>Total</b>	<b>931 651</b>	<b>-</b>

### Remuneration of the Managing Director SANSA Space Operations: Mr. R Hodges

Annual Remuneration	1 070 780	1 005 243
Performance Bonus	71 091	66 254
Car and Travel Allowance	57 105	54 000
Contributions to UIF, Medical, cellphones and Pension Funds	155 820	146 332
<b>Total</b>	<b>1 354 796</b>	<b>1 271 829</b>

### Remuneration of the Managing Director SANSA Earth Observation: Dr. J Olwoch

Annual Remuneration	1 069 454	999 490
Performance Bonus	67 111	62 838
Contributions to UIF, Medical, cellphones and Pension Funds	89 548	84 348
<b>Total</b>	<b>1 226 113</b>	<b>1 146 676</b>

### Remuneration of the Managing Director SANSA Space Science: Dr. L McKinnell

Annual Remuneration	1 076 437	1 006 015
Performance Bonus	67 549	63 248
Contributions to UIF, Medical, cellphones and Pension Funds	90 067	84 833
<b>Total</b>	<b>1 234 053</b>	<b>1 154 096</b>

## 21 BOARD MEMBERS REMUNERATION

Non-executive Chairperson Ms J Lawrence<sup>1</sup>  
 Non-executive Chairperson Mr MT Magugumela<sup>2</sup>  
 Other Board members

### Total Board members Remuneration

Mr. V C Gore  
 Mr. L S Hamilton  
 Mr. E Jansen  
 Ms. G E. Khambule  
 Mr. O A Latiff (9 months deceased September 2015)  
 Mr. P Maine  
 Ms. M I Matookane  
 Ms. M Mfeka  
 Dr. N P Mjoli  
 Mr. J Prinsloo  
 Prof. R. Bharuthram  
 Mr. M Rezelman  
 Mr. W J van Biljon  
 Mr. L Annamalai<sup>2</sup>  
 Mr. S S Faku<sup>3</sup>  
 Capt. M Mamashela<sup>2</sup>  
 Ms. L Mogudi<sup>2</sup>  
 Mr. R G Nicholls<sup>3</sup>  
 Adv. T Ratsheko<sup>2</sup>  
 Mr. M Riba<sup>4</sup>  
 Mr. A Naidoo<sup>4</sup>  
 Mr. J Mphepya<sup>2</sup>  
 Ms. D Manyadi<sup>2</sup>  
 Dr. E Gavin<sup>2</sup>  
 Dr. R Scholes<sup>2</sup>  
 Mr. M Zondi<sup>2</sup>  
 Mr. A Walker<sup>2</sup>

	2016	2015
	R	R
Non-executive Chairperson Ms J Lawrence <sup>1</sup>	104 491	47 075
Non-executive Chairperson Mr MT Magugumela <sup>2</sup>	-	26 531
Other Board members	809 779	576 513
<b>Total Board members Remuneration</b>	<b>914 270</b>	<b>650 119</b>
Mr. V C Gore	35 429	50 586
Mr. L S Hamilton	52 180	28 511
Mr. E Jansen	62 637	30 882
Ms. G E. Khambule	44 155	48 262
Mr. O A Latiff (9 months deceased September 2015)	29 868	31 159
Mr. P Maine	58 952	32 734
Ms. M I Matookane	88 019	42 436
Ms. M Mfeka	88 654	46 774
Dr. N P Mjoli	72 588	28 579
Mr. J Prinsloo	74 560	26 393
Prof. R. Bharuthram	51 749	34 944
Mr. M Rezelman	83 320	79 860
Mr. W J van Biljon	67 668	41 884
Mr. L Annamalai <sup>2</sup>	-	16 764
Mr. S S Faku <sup>3</sup>	-	448
Capt. M Mamashela <sup>2</sup>	-	7 239
Ms. L Mogudi <sup>2</sup>	-	8 446
Mr. R G Nicholls <sup>3</sup>	-	374
Adv. T Ratsheko <sup>2</sup>	-	19 335
Mr. M Riba <sup>4</sup>	-	-
Mr. A Naidoo <sup>4</sup>	-	-
Mr. J Mphepya <sup>2</sup>	-	-
Ms. D Manyadi <sup>2</sup>	-	-
Dr. E Gavin <sup>2</sup>	-	-
Dr. R Scholes <sup>2</sup>	-	-
Mr. M Zondi <sup>2</sup>	-	-
Mr. A Walker <sup>2</sup>	-	903

<sup>1</sup> Appointed as Chairperson on 1 September 2014

<sup>2</sup> Term ended 31 August 2014

<sup>3</sup> Mr R G Nicholls and Mr S S Faku were lead independent Non-Executive Audit and Risk committee and the Human Resources and Social Ethics committee respectively. Their term ended on 31 August 2014.

<sup>4</sup> Mr M Riba and Mr A Naidoo are current board members who were not remunerated as they work for State Departments.

	2016 R	2015 R
<b>22 DEPRECIATION AND AMORTISATION</b>		
Depreciation: Property, Plant and Equipment	17 494 158	16 437 574
Amortisation: Intangible Assets	7 603 029	6 465 089
Impairment loss: Intellectual Property	-	1 440 000
<b>Total Depreciation and Amortisation</b>	<b>25 097 187</b>	<b>24 342 663</b>
<b>23 FINANCE COSTS</b>		
Finance Leases	10 202	49 680
Interest Paid	-	-
Total Interest Expense	10 202	49 680
<b>Total Interest Paid on External Borrowings</b>	<b>10 202</b>	<b>49 680</b>
<b>24 GRANTS AND SUBSIDIES PAID</b>		
Bursaries to students	3 344 598	2 261 002
Research and development	277 800	411 000
<b>Total Grants and Subsidies</b>	<b>3 622 398</b>	<b>2 672 002</b>
<b>25 ANTENNA INFRASTRUCTURE SERVICES</b>		
Antenna Infrastructure Services	4 146 811	1 102 997
<b>Total Antenna Infrastructure Services</b>	<b>4 146 811</b>	<b>1 102 997</b>
<b>26 TRAINING EXPENSES</b>		
Staff Training	1 271 440	1 204 523
Board Member Training	9 535	358
Staff Bursaries	452 827	373 982
<b>Total Training Expenses</b>	<b>1 733 802</b>	<b>1 578 863</b>

## 27 GENERAL EXPENSES

	2016 R	2015 R
Advertising & Marketing	1 649 695	2 205 768
Audit Fees	1 566 068	2 412 105
Bank Charges	154 666	118 879
Consulting fees	877 336	2 669 843
Conferences and Seminars	725 250	661 748
Consumables	60 594	89 805
Electricity	6 548 621	5 156 829
Entertainment	218 622	157 362
Fuel and Oil	943 819	362 208
Insurance	1 350 627	1 061 768
Legal Costs	348 726	129 386
License fees	3 290 574	3 407 221
Other General Expenses	5 266 186	9 393 063
Printing and Stationery	832 735	639 731
Rent and lease charges	3 766 740	3 333 675
Travel and accommodation	5 860 448	5 624 113
Security	1 226 719	961 385
Telephone Cost	1 162 923	1 628 779
Data and internet services	11 368 589	9 863 578
Transport Costs	159 894	283 066
	<b>47 378 832</b>	<b>50 160 312</b>

The amounts disclosed above for Other General Expenses are in respect of costs incurred in the general management of the entity and not directly attributable to a specific service or class of expense.



## 28 (Gains) in net Foreign Exchange:

(Gains) in net Foreign Exchange - realised

(Gains) in net Foreign Exchange - unrealised

### Losses in net Foreign Exchange:

Losses in net Foreign Exchange - realised

Losses in net Foreign Exchange -unrealised

### Net foreign Losses/(Gains)

2016	2015
R	R
<b>(1 005 393)</b>	<b>(4 160 657)</b>
(2 392 572)	(2 047 967)
1 387 179	(2 112 690)
<b>6 475 922</b>	<b>1 980 842</b>
3 350 598	1 831 707
3 125 324	149 135
<b>5 470 529</b>	<b>(2 179 815)</b>

SANSA's policy has always been to use foreign debtors and creditors as a natural hedge for its foreign currency denominated transactions. Due to the volatile Rand during the year under review and the huge SPOT liability that SANSA is carrying (refer to Note 13), that was not supplement by an equivalent foreign debtor revenue the SPOT transactions resulted in significant forex currency losses.

## 29 LOSS ON DISPOSAL OF PROPERTY, PLANT & EQUIPMENT

Loss on Disposal of Property, Plant and Equipment

1 149 071	149 771
<b>1 149 071</b>	<b>149 771</b>

## 30 RENDERING OF SERVICES

Services to local Public entities

28 872 468

27 875 130

Services to local Private entities

1 241 507

1 238 424

Services to Foreign clients

66 714 653

38 567 304

Other services rendered

-

897

**96 828 628**

**67 681 755**

## 31 DATA LICENCE FEES

Data licence fees

31 406 738

26 729 023

**31 406 738**

**26 729 023**

Data licence fees consists mainly of SPOT data access fees for downloading satellite imagery for Earth observation services.

## 32 CASH GENERATED BY OPERATIONS

### Surplus for the Year

Adjustment for:

Depreciation and Amortisation

Impairment of Intellectual Property

Loss on Disposal of Property, Plant and Equipment

Net Losses / (Gains) on foreign exchange transactions

Sundry income

Operating lease smoothing

Interest Paid

Discount Received

### Operating surplus before working capital changes

Increase in Inventories

Increase In Receivables from exchange and non- exchange transactions

Increase in Creditors, Provisions and unspent conditional grants and receipts

### Cash flow from operating activities

	2016 R	2015 R
	<b>113 272 899</b>	<b>31 653 073</b>
Depreciation and Amortisation	25 097 187	22 902 663
Impairment of Intellectual Property	-	1 440 000
Loss on Disposal of Property, Plant and Equipment	1 149 071	149 771
Net Losses / (Gains) on foreign exchange transactions	5 470 529	(2 179 815)
Sundry income	237 668	12 768
Operating lease smoothing	232 043	-
Interest Paid	10 202	-
Discount Received	(26 507)	5 784
	<b>145 443 092</b>	<b>53 984 244</b>
Increase in Inventories	(16 409)	(71 522)
Increase In Receivables from exchange and non- exchange transactions	(736 368)	(2 157 407)
Increase in Creditors, Provisions and unspent conditional grants and receipts	29 160 210	24 341 027
	<b>173 850 525</b>	<b>76 096 342</b>

### 33 CORRECTION OF PRIOR PERIOD ERROR

2015  
R

Comparatives amounts relating to Statement of Financial performance have been restated as follows:

#### 33.1 Revenue from Non-exchange Transactions:

Transfers and Subsidies Received - Previously reported	180 585 255
Transfers and Subsidies Received - Restated amount	163 585 721
<b>Net Effect on Revenue for the year</b>	<b>(16 999 534)</b>

#### Revenue from Exchange Transactions:

Rendering of Services - Previously reported	69 699 755
Rendering of Services - Restated amount	67 681 755
<b>Net Effect on Revenue for the year</b>	<b>(2 018 000)</b>

#### Expenditure

Research and Development Costs - Previously reported	19 017 534
Research and Development Costs - Restated amount	-
<b>Net Effect on Expenditure for the year</b>	<b>19 017 534</b>

#### Net effect on surplus for the year

**-**

The restatement of prior year transactions relates to the correction of classification errors, where SANSA reflected grants received as revenue from non exchange transactions and grants paid as research and development costs. Whereas SANSA was acting as an agent rather than a principal for transfers to Denel relating to the incentive offer to former Sunspace Employees for retention of core capabilities in satellite engineering as well as the upgrade of the assembly integration and testing facilities.

#### 33.2 RECLASSIFICATION OF GENERAL EXPENSES

During the current financial year in line with the requirements of para37 of GRAP 1 - Presentation of Financial Statements, Management took a decision to further split General Expenses so as to disclose Training Expenditure and Antenna Infrastructure Services separately as the nature of the two categories of the expenditure were individually material. The changes done were not correction of an error however it was necessary to split General Expenses so to provide the users of the Annual Financial Statements with useful information to enable them to understand the nature of expenditure disclosed under General Expenses.

The reclassification of Training Expenditure and Antenna Infrastructure was based on Management's decision and should be separated from the prior year error relating to Employee related costs, where Employee related costs were understated by disclosing remote allowance, cell phone costs and housing allowance under General Expenses. The disclosure on the error relating to payroll cost and Management's decision to split General Expenditure has been combined as the combined changes will not result in any changes in the Net Surplus figure previously disclosed in the prior year, however the combined changes will have an impact of further splitting General Expenses into the following categories:

- Training expense: (new disclosure)
- Antenna Infrastructure Services: (new disclosure)
- Employee related costs: (error previously disclosed under General Expenses as disclosed under Note 33.3)

### 33.3 EMPLOYEE COSTS

	<b>2015</b>
	<b>R</b>
Employee cost - Previously reported	89 615 433
Employee cost - Restated amount	93 019 880
General expenses- Previously reported	56 246 619
General expenses - Restated amount	50 160 312
Antenna Infrastructure Services - Previously reported	-
Antenna Infrastructure Services - Restated amount	1 102 997
Training Expenses - Previously reported	-
Training Expenses - Restated amount	1 578 863
<b>Net Effect on Expenditure for the year</b>	<b>-</b>

During the 2014/15 the following expense categories were disclosed as part of general expenses instead of being disclosed as part of employee costs as the employees had received a fringe benefit that was taxable( Remote allowance R2.948m, Housing allowance R0.042m, Cell phone allowance R0.415m)

Furthermore Management took a decision to split General Expenses and separately disclose Training Expenses R1.578m and Antenna Infrastructure R1.102m, as disclosed in Note 33.2

### 33.4 FINANCE LEASE

	<b>2015</b>
	<b>R</b>
Current Portion of Finance Lease - Previously reported	(5 609 570)
Current Portion -Long Term Liability - Restated amount	(5 609 570)
Non- current portion Finance Lease - Previously reported	(9 177 630)
Non Current Portion -Long Term Liability - Restated amount	(9 177 630)
<b>Net Effect on Net Assets for the year</b>	<b>-</b>

During the 2014/15 Financial year a total amount of R14.8m split between R5.6m current portion and R9.2m non current portion was disclosed as a Finance Lease instead of as a Long term liability. The implication is that finance leased asset are not owned by the entity until the end of the lease term when the entity has an option to acquire, as opposed to when the debt is disclosed as a liability, where the entity has rights of ownership. SANSA has rights of ownership to the SPOT terminal and its software, but has agreed on payment terms for the acquisition of these assets.

## 34 FRUITLESS AND WASTEFUL EXPENDITURE

### Fruitless and Wasteful Expenditure

Reconciliation of Fruitless Expenditure:

	2016 R	2015 R
Opening balance	-	-
Fruitless and Wasteful Expenditure incurred	-	12 811
Fruitless and Wasteful Expenditure irrecoverable and written off	-	(12 811)
	-	-
Fruitless and Wasteful Expenditure awaiting recovery or write off	-	-

### Details of Fruitless and Wasteful Expenditure

Nature of the expenditure	Disciplinary Steps / Criminal Proceedings	2016	2015
Expenditure incurred was due to last minute cancellation of a meeting and therefore the venue could not be cancelled at short notice.	The amount to be written off as the cancellation of the meeting was not initiated by SANSA	-	3 518
Expenditure incurred in the form of attorney recovery fees for money that was paid erroneously into the wrong supplier bank account.	Employee was engaged on the matter. The employee is not liable in law for the attorney fees and the amount was to be written off	-	2 459
The expenditure incurred relates to double payments to a supplier.	Employee was engaged on the matter. The amount is recoverable from the supplier.	-	6 834
		-	12 811

### 35 IRREGULAR EXPENDITURE

Reconciliation of Irregular Expenditure:

	2016 R	2015 R
Opening balance	-	-
Irregular Expenditure incurred	-	166 270
Irregular Expenditure condoned	-	(166 270)
Amounts not recoverable (Not Condoned)	-	-
Irregular Expenditure awaiting condonation	-	-
	<u>-</u>	<u>-</u>

#### Details of irregular expenditure condoned. No person liable in law.

Supply chain policy not followed:	Disciplinary Steps / Criminal Proceedings	2016	2015
As per SANSA's delegation, all manager can approve up to R30 000. A manager approved quotation for an expenditure of R90 807,27 which is above her delegated authority.	Employee was engaged on the matter and she indicated that an in principle approval was given by her line-manager and, based on this, she signed the quotation. The employee was warned that even if an in principle approval is given, it has to be confirmed by an official sign-off by the appropriately delegated authority. Employee was verbally warned to strictly follow due process.	-	90 807
The procurement process was not followed for a single source supplier and the contract was signed without first being vetted by the SANSA Legal Unit as per policy.	Employee was engaged on the matter. Notwithstanding backlogs in the vetting process, failure to vet contract is a huge risk for SANSA. Employee was given a stern written warning not to repeat this.	-	15 513
Approval and procurement process was not followed for a single source supplier and payments made based on invoices received	The disciplinary process is still in progress	-	59 950
		<u>-</u>	<u>166 270</u>

## 36 COMMITMENTS FOR EXPENDITURE

### Capital and Expenditure Commitments

#### - Approved and Contracted for:-

Property, Plant and Equipment

Intangible assets

Expenditure

#### - Approved but Not Yet Contracted for:-

Property, Plant and Equipment

Expenditure

### Total Capital and Expenditure Commitments

#### This expenditure will be financed from:

Own Resources

	2016	2015
	R	R
	<b>353 021 114</b>	<b>79 301 340</b>
Property, Plant and Equipment	335 383 847	70 717 649
Intangible assets	8 662 628	-
Expenditure	8 974 639	8 583 691
	-	-
	-	-
	<b>353 021 114</b>	<b>79 301 340</b>
	<b>353 021 114</b>	<b>79 301 340</b>
Own Resources	353 021 114	79 301 340
	<b>353 021 114</b>	<b>79 301 340</b>

## 37 EMPLOYER RETIREMENT BENEFIT INFORMATION

The only obligation of the entity with respect to the retirement benefit plans is to make the specified contributions.

The total expense recognised in the Statement of Financial Performance represents contributions payable to the plan by the entity at rates specified in the rules of the plan. These contributions have been expensed.

## 38 RELATED PARTY TRANSACTIONS

### Related party relationships:

South African National Space Agency (SANSA) is a Public Entity under the control of the Department of Science and Technology South Africa. The Agency is a schedule 3A Public entity in terms of the Public Finance Management Act, Act 1 of 1999 as amended by Act 29 of 1999, and therefore falls within the national sphere of government. SANSA has a significant number of related parties, being those that fall within the national sphere of government. Amounts due from / (to) these entities are subject to the same terms and conditions as normal trade receivables and trade payables and transactions with these entities are concluded at arm's length.

A detailed list of transactions with related parties and amounts due to / from related parties are as follows:

Entity Name	2016		2015	
	Revenue	Receivables	Revenue	Receivables
Department of Science and Technology	232 441 074	-	161 567 721	-
Air Traffic Navigation Services SOC Limited (ATNS)	31 890	-	-	-
Armaments Corporation of South Africa Limited (ARSMCOR)	3 089 114	-	3 177 209	143 614
Council for Scientific and Industrial Research (CSIR)	306 632	306 632	-	56 777
Denel Aviation	75 976	-	-	-
Denel Soc Ltd t/a Denel Dynamics	108 430	14 168	-	179 430
Department of Defence	7 816 814	-	-	-
Eskom	5 000 000	-	5 000 000	5 067 000
Institute for Maritime Technology	1 222 848	636 608	-	-
National Research Foundation (NRF)	6 205 478	-	-	-
National Research Foundation (NRF - HartRAO)	2 916 180	-	-	-
South African Agency for Science and Technology (SAASTA)	63 496	-	-	-
Statistics SA	9 000 000	-	-	-
Total	268 277 932	957 408	169 744 930	5 446 821



### 38 RELATED PARTY TRANSACTIONS (Continued)

Entity Name	2016		2015	
	Purchases	Payables	Purchases	Payables
Council for Scientific and Industrial Research CSIR	-	-	2 989 179	-
Armaments Corporation of South Africa Limited (ARSMCOR)	5 989	-	3 184 535	709
Compensation Fund	54 101	-	-	-
Denel Soc Ltd t/a Denel Dynamics	118 801 306	13 240 597	41 573 111	-
Denel Overberg Test Range	1 368	-	-	-
Engineering Council of South Africa (ECSA)	7 540	-	-	-
Eskom	4 871 722	-	5 087 358	12 980
Government Printing	15 656	1 036	-	-
Government Printing Works	-	-	30 521	-
Independent Communications Authority of South Africa (ICASA)	675 270	-	726 520	674 920
National Library of South Africa	-	-	650	-
National Research Foundation	-	-	3 433 602	-
SA Post Office	1 431	-	-	-
Sentech	16 429	-	-	-
South African Astronomical Observatory (SAAO)	110 810	7 520	-	-
South African Broadcasting Corporation Limited	6 503	-	4 663	-
South African Bureau of Standards	129 963	-	108 144	-
South African Civil Aviation Authority (SACAA)	3 355	-	1 290	-
South African Revenue Services (SARS)	642 336	-	-	-
South African Weather Service	-	-	8 918	-
Telkom SA Limited	773 676	5 290	989 642	71 688
<b>Total</b>	<b>126 117 455</b>	<b>13 254 443</b>	<b>58 138 133</b>	<b>760 297</b>

## 38 RELATED PARTY TRANSACTIONS (CONTINUED)

With the exception of transactions disclosed below, all other transactions with related parties were normal supplier and/or client/recipient relationships on terms and conditions no more or less favourable than those which it is reasonable to expect the entity to have adopted if dealing with that individual entity or person in the same circumstances; and terms and conditions within the normal operating parameters established by that reporting entity's legal mandate.

During the year under review mosaic images were provided at none arms length to the following related party as no fee was charged for the services rendered:

1. Council for Scientific and Industrial Research (CSIR)
2. Department of Geospatial Information (DGI)
3. Electoral Commission of South Africa (IEC)
4. Department Public Service & Administration
5. Department of Environmental Affairs
6. Square kilometer Array (SKA)

During the year under review SANSa received 33 grants from the National Research Foundation (NRF) to fund different research projects, the details of the grants the liabilities and revenues relating to the grant are disclosed in note 17.3

SANSa received funding to stimulate the local space industry, which is mainly focused on the retention of the core capability for the satellite engineering, through an incentive payable to former Sunspace employees payable over three years and the upgrade of the assembly, integration and testing facilities. Transfers were mainly to Denel who are the custodians of the facilities and have absorbed the former Sunspace employees refer to Note 18 for detailed disclosure of revenues and liabilities relating to this commitment.

Further more the satellite development project is a multi year project funded through a grant from DST. SANSa has a current contractual commitment with Denel for the development of the satellite. The current remaining contract value for the satellite build project is R281 million which is disclosed under note 36: Commitments for expenditure. The project is estimated to be completed in 2018/19, refer to Note 17 for detailed disclosure of revenues and liabilities relating to this commitment.

For key management emoluments, refer to note 20 and note 21.

## 39 PENDING LAND CLAIM

The land claim remains pending since approximately 2008 in respect of the property upon which SANSa Space Operations is located. South African National Space Agency (SANSa) is not the owner of the land, however the Department of Science and Technology has pronounced its support of the application to be made by SANSa to the Department of Public Works to formalise the land use rights toward the property. In respect of the land claim proceedings, SANSa has also facilitated the filing of the notice to intervene as an interested party in November 2014 with the Randburg Land Claims Court. A scientific expert report is also being finalised and will be submitted in support of the notice to intervene and also used in support of the submission to Department of Public Works as part of the application for formalised land use rights.

#### 40 IN-KIND DONATIONS AND ASSISTANCE

No donations in-kind and assistance were received at 31 March 2016

#### 41 EVENTS AFTER THE REPORTING DATE

No events having financial implications requiring disclosure occurred subsequent to 31 March 2016.

#### 42 GOING CONCERN

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

#### 43 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES

All Financial instruments arise directly from operations.

The entity does not enter into any derivative transactions. The main risk arising from the entity's financial instruments are cash flow interest rate risk, liquidity risk and credit risk.

The entity reviews and implements policies managing each of these risks. There are no significant concentrations of risk. Compliance with policies and procedures is reviewed by internal and external auditors on a continuous basis.

##### **The carrying amounts of financial liabilities at reporting date was:**

	<b>2016</b>	<b>2015</b>
	<b>R</b>	<b>R</b>
Trade and other payables	38 281 160	25 195 017
Current Portion -Long Term Liability	5 891 830	4 588 815
Current Portion of Finance Lease	-	102 992
Operating Lease Liability	-	232 043
Non -Current Portion -Long Term Liability	5 891 799	9 177 630
	<b>50 064 789</b>	<b>39 296 497</b>

## 43 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES (Continued)

### Interest Rate Risk

No material risk exists due to there being no material finance costs in the current finance year. The only real risk that exists is the risk of variations in cash flow due to changes in the interest rate, which will affect interest income.

The entity's income and operating cash flows are substantially independent of changes in the market interest rates.

<b>31 March 2016</b>	<b>Floating Interest Rate</b>	<b>Non-interest Bearing</b>	<b>Total</b>
<b>Assets</b>			
Receivables from Exchange Transactions	-	18 046 991	18 046 991
Receivables from Non-Exchange Transactions	-	2 540 088	2 540 088
Cash and cash equivalents	178 449 966	8 573	178 458 539
<b>Liabilities</b>			
Trade and other payables	-	(38 281 160)	(38 281 160)
Long Term Liability		(11 783 629)	(11 783 629)
<b>Net Financial assets/(Liabilities)</b>	<b>178 449 966</b>	<b>(29 469 137)</b>	<b>148 980 829</b>
<b>31 March 2015</b>			
	<b>Floating Interest Rate R</b>	<b>Non-interest Bearing R</b>	<b>Total R</b>
<b>Assets</b>			
Receivables from Exchange Transactions	-	17 443 498	17 443 498
Receivables from Non-Exchange Transactions	-	2 407 214	2 407 214
Cash and cash equivalents	123 219 767	8 782	123 228 549
<b>Liabilities</b>			
Trade and other payables	-	(25 195 017)	(25 195 017)
Long Term Liability	-	(13 766 445)	(13 766 445)
Operating Lease Liability	-	(232 043)	(232 043)
Current Portion of Finance Lease	(102 992)	-	(102 992)
<b>Net Financial assets/(Liabilities)</b>	<b>123 116 775</b>	<b>(19 334 011)</b>	<b>103 782 764</b>

## 43 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES (Continued)

### Interest Rate Sensitivity Analysis

The sensitivity analysis below was determined based on the exposure to interest rates at the reporting date. For variable rate long-term instruments, the analysis is prepared assuming the amount of the instrument outstanding at the reporting date was outstanding for the whole year. A 100 basis point increase or decrease was used, which represents management's assessment of the reasonably possible change in interest rates.

#### Effect of a change in interest rate on interest bearing financial assets and liabilities

<b>Financial Assets</b>	<b>Classification</b>	<b>2016</b>	<b>2015</b>
		<b>R</b>	<b>R</b>
<b>External investments:</b>			
Call Deposits	Loans and receivables	-	-
Bank Balances	Loans and receivables	178 449 966	123 219 767
Cash Floats and Advances	Loans and receivables	8 573	8 782
		<u>178 458 539</u>	<u>123 228 549</u>
<b>Interest received</b>		<b><u>8 394 522</u></b>	<b><u>5 579 080</u></b>
<b>Interest rate</b>		<b><u>4,7%</u></b>	<b><u>4,5%</u></b>
<b>Effect of a change in interest rate on interest earned from external investments:</b>			
Effect of change in interest rate	%	1%	1%
Effect of change in interest rate	Rand value	1 784 585	1 232 285
Effect of change in interest rate	%	-1%	-1%
Effect of change in interest rate	Rand value	<u>(1 784 585)</u>	<u>(1 232 285)</u>



## 43 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES (Continued)

### Market and Credit risk

Financial assets which potentially subject the entity to the risk of non-performance by counter parties consist of Receivables from exchange and non-exchange.

An allowance for impairment is established based on management's estimate of any identified potential losses in respect of Receivables from exchange and non-exchange. Bad debts identified are written off as they occur. The entity does not have any significant credit risk exposure to any single counterparty. There is a foreign exchange risk due to the existence of international debtors. These debtors however have strict 30 day payment terms which ensures that the movement in exchange rates are limited to a shorter time period.

### The entity's exposure to foreign currency risk was as follows:

	31 March 2016				
	Total	ZAR	EURO	USD	GBP
Receivables from Exchange Transactions	18 046 991	9 681 652	218 074	158 742	363 765
Trade payables	(38 281 160)	(35 471 412)	(131 299)	(36 764)	-
<b>Gross exposure</b>	<b>(20 234 169)</b>	<b>(25 789 760)</b>	<b>86 775</b>	<b>121 978</b>	<b>363 765</b>

	31 March 2015				
	Total	ZAR	EURO	USD	GBP
Receivables from Exchange Transactions	17 443 498	14 697 590	2 745 908	-	-
Trade payables	(25 195 017)	(24 742 841)	(452 176)	-	-
<b>Gross exposure</b>	<b>(7 751 519)</b>	<b>(10 045 251)</b>	<b>2 293 732</b>	<b>-</b>	<b>-</b>

## 43 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES (CONTINUED)

The following significant exchange rates applied during the year:

### Year-end spot rate

	2016	2015
Euro	17,16	13,03
GBP	16,56	16,39
USD	15,24	12,14

### Sensitivity analysis

A 10% weakening of the rand against the above currencies at 31 March would have had the equal but opposite effect on the above currencies to the amounts shown above, on the basis that all other variables remain constant.

Euro	148 906	229 373
GBP	602 395	-
USD	185 894	-
<b>Total</b>	<b>937 195</b>	<b>229 373</b>

A 10% strengthening of the rand against the following currencies at 31 March 2016 would have decreased profit or loss by the amounts shown below. This analysis assumes that all other variables remain constant. The analysis is performed on the same basis as was performed at 31 March 2015.