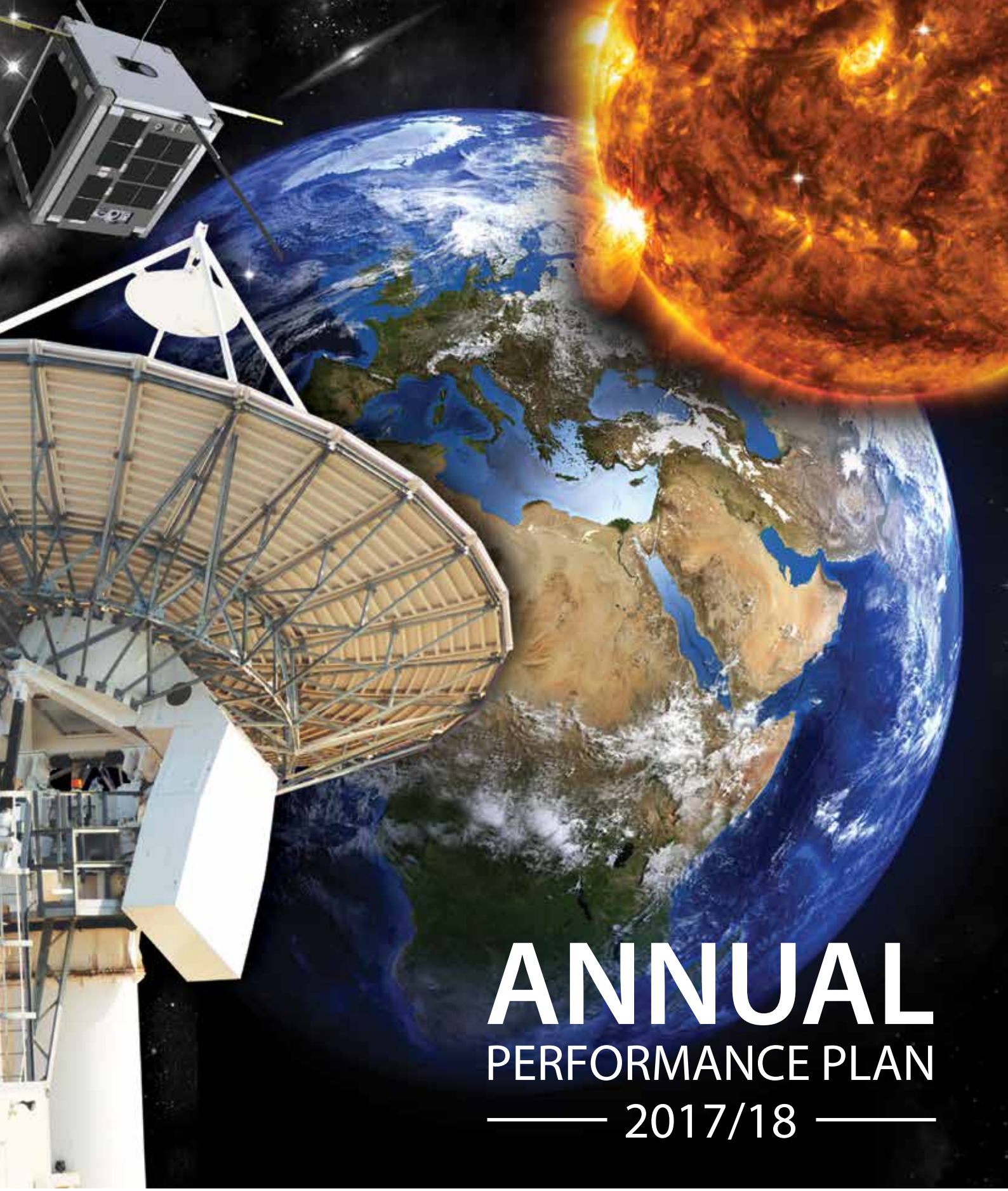


ANNUAL PERFORMANCE PLAN 2017/18

science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

sansa
SOUTH AFRICAN NATIONAL SPACE AGENCY

Foreword

The global space industry continues to grow and develop, and SANSA continues to contribute to these achievements. Our focus remains on positioning South Africa as an international hub with space solutions for the world of the future.

Our core mission is to lead and inspire the South African space community to help create a better future. In this regard, our Annual Performance Plan for 2017/18 aims to address South Africa's developmental challenges and create growth opportunities.

SANSA will continue to develop and grow the South African space industry, collaborate with national and global partners, and drive the transformation of the country towards a knowledge- based economy through the use of space products and services. Especially significant is the Agency's ability to deliver decision support tools for government that addresses national challenges and contribute(s) to impactful research and development that leads to improved space based applications. Therefore, nurturing high-end skills both for the space sector, and other industrial sectors, is critical to the Agency's focus. As an international hub for space solutions, we will continue to foster and deepen our international partnerships, both on the African continent and abroad.

SANSA continues to transform into a high performance Agency, which will ensure its growth and sustainability. We are mindful of the triple challenges of inequality, poverty and unemployment in South Africa and we will continue to address these challenges through our various initiatives.

Our Annual Performance Plan objectives are in alignment with our Strategic Plan 2015-2020. However, the marginal year on year budget increase that SANSA has received, has resulted in the downward revision of some of the Agency's performance targets. Despite this, the Board, management and staff of the Agency remain committed to delivering on our mandate notwithstanding our financial challenges.

We believe that the Annual Performance Plan for 2017-2018 will continue to drive the positioning of SANSA as a credible global space player whilst achieving a meaningful impact on our South African and African challenges.

We are indeed living in exciting times and as we witness the international space initiatives overhead we are reminded of SANSA's role in lifting South Africa's eyes to glimpse at the possibilities that our future holds.

Thank you

Joy-Marie Lawrence

Chairperson of the SANSA Board

Accounting Authority

Official sign-off

It is hereby certified that this Annual Performance Plan:

- was developed by the management and Board of the South African National Space Agency (SANSA) in consultation with the Department of Science & Technology (DST);
- was prepared in line with the current Strategic Plan of SANSA; and
- accurately reflects the performance targets that SANSA will endeavour to achieve given the resources made available in the budget for 2017/18.

Ms Bulelwa Pono Signature: _____

Chief Financial Officer

Dr Valanathan Munsami Signature: _____

Chief Executive Officer

Ms Joy-Marie Lawrence Signature: _____

Board Chairperson on behalf of Accounting Authority

Approved by:

Mrs Naledi Pandor Signature _____

Minister of Science and Technology

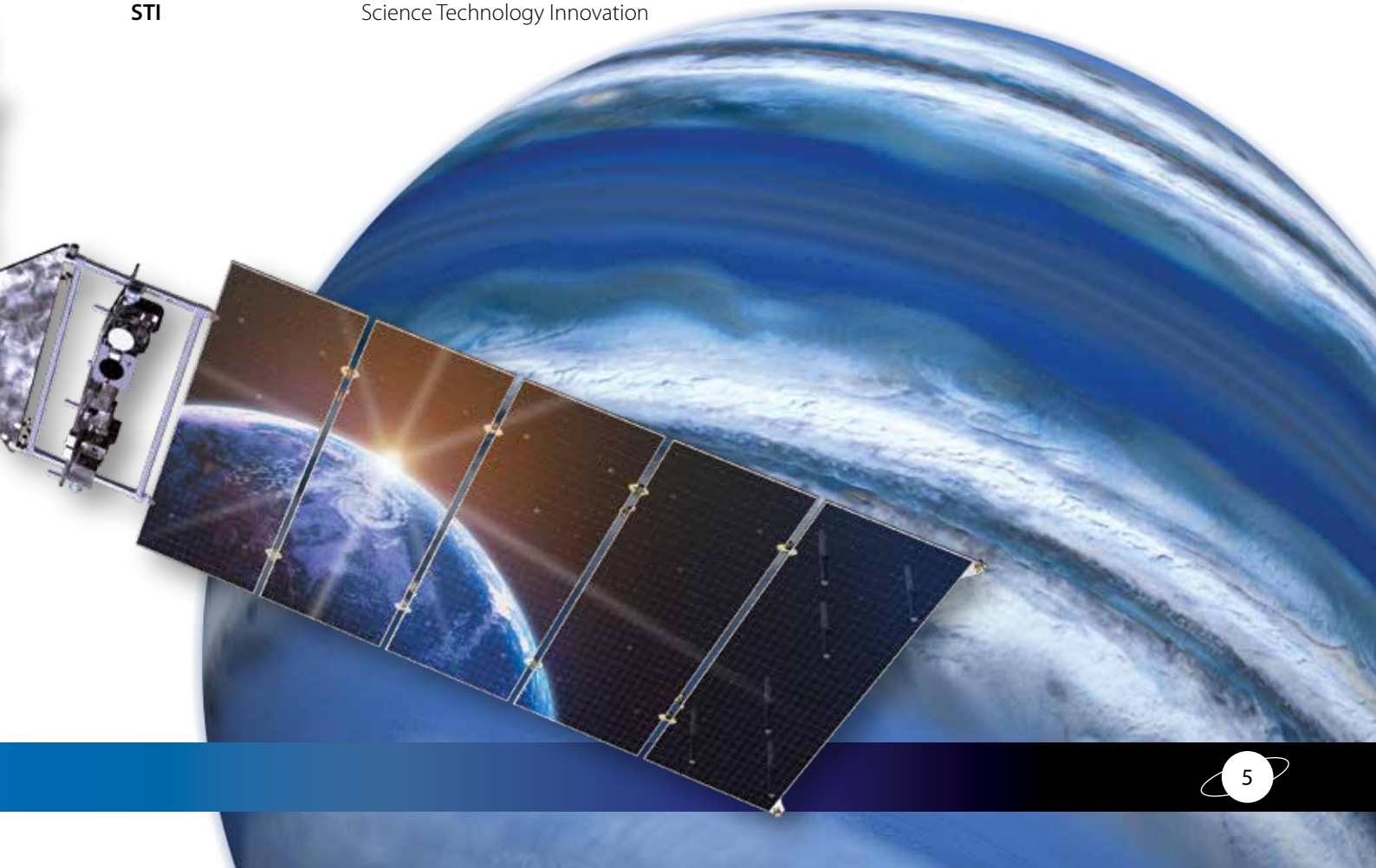
Executive Authority

Contents

ACRONYMS

ABBREVIATION	MEANING
AfriGEOSS	African Group on Earth Observation System of Systems
AIT	Assembly Integration and Testing Facility
ARMC	African Resource Management Constellation
AU	African Union
BRICS	Brazil, Russia, India, China and South Africa
CBERS	China Brazil Earth Resource Satellite
CEOS	Committee on Earth Observation Satellites
COSPAR	Committee on Space Research
CSP	Corporate Support Programme
DST	Department of Science and Technology
EISCAT	European Incoherent Scatter Scientific Association
EODC	Earth observation Data Centre
EOP	Earth Observation Programme
ESA	European Space Agency
EVP	Employee Value Proposition
GEO	Group on Earth Observation
GEOGLAM	Group on Earth Observation Global Agriculture Monitoring
GICs	Geomagnetically Induced Currents
GPS	Global Positioning System
HCD	Human Capacity Development
HF	High Frequency
IAF	International Astronautical Federation
ICAO	International Civil Aviation Organisation
ICT	Information Communication Technology
ISES	International Space Environment Service
LEO	Low Earth Orbit
MODIS	Moderate Resolution Imaging Spectroradiometer
MTEF	Medium Term Expenditure Framework
MTSF	Medium- Term Strategic Framework
NASA	National Aeronautics and Space Administration
NASSP	National Astronomy and Space Science Programme
NDP	National Development Plan
NEOP	National Earth Observation Programme

NRF	National Research Foundation
NSEP	National Space Engineering Programme
NSOP	National Space Operations Programme
NSP	National Space Programme
NSS	National Space Strategy
NSSP	National Space Science Programme
PNT	Positioning Navigation and Timing
R&D	Research and Development
SAASTA	South African Agency for Science and Technology
SADC	Southern African Development Community
SAEOS	South African Earth Observation Strategy
SARB	South African Reserve Bank
SCAR	Scientific Committee on Antarctic Research
SEP	Space Engineering Programme
SET	Science Engineering and Technology
SMEs	Small Medium Enterprises
SMMEs	Small Medium and Micro-sized Enterprises
SOP	Space Operations Programme
SSP	Space Science Programme
STEM	Science, Technology, Engineering, Mathematics
STI	Science Technology Innovation



EXECUTIVE SUMMARY

SANSA's vision is to position "South Africa as an international hub for space solutions for the world of the future" and the mission of the Agency is to "Lead and inspire the South African Space community to create a better future." To achieve this, SANSA has seven strategic goals:

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.

The first five goals are outwardly looking, seeking to promote and facilitate the national aspects of the SANSA vision and mission. The last two goals are inward looking, which seek to transform SANSA into a high performance organisation and to ensure the sustainability of the Agency. SANSA implements its seven strategic goals by clustering its activities across five broad strategic programmes, as listed below:

Programme 1: Administration Support Programme.

Programme 2: Earth Observation Programme.

Programme 3: Space Science Programme.

Programme 4: Space Operations Programme.

Programme 5: Space Engineering Programme.

The National Development Plan (NDP), the National Space Strategy (NSS), the South African Earth Observation Strategy (SAEOS) and other relevant strategies and policies of government informs the strategic focus of SANSA. For example, the creation of high-technology jobs; the improvement of geospatial information to support the development of marginalised communities; promote the planning and monitoring of vital national infrastructure; and provide critical health, safety and security data are ways by which SANSA contributes to the NDP.

Key Deliverables for the Year

1. SANSA will deliver the following five high-impact products and services (i) Operations Phakisa national ocean and coastal information system, (ii) Satellite data and high-quality value-added products; (iii) national land-use and land-cover base maps; (iv) space weather products and services; (v) magnetic technology products and services.
2. SANSA will produce three policy briefs on (i) Earth Observation and Food Security; (ii) Safety and Security Applications from a Magnetically Clean Environment; and (iii) The Size and Health of the South African Space Programme and Proposed Growth.
3. SANSA will provide support to approximately 75 students for postgraduate studies in Earth Observation, Space Science, Space Operations and Space Engineering.
4. SANSA will aim to achieve a research productivity score of 1 200, which is a composite score based on publications, graduated students, research funding, and researcher rating achieved (see Annexure for further explanation).
5. SANSA will aim to generate about R60 million from both national and international space operations contracts.
6. SANSA aims to support 55 external jobs and out-source in excess of R65 million to the broader space industry and R13 million to SMEs through the satellite build programme.
7. SANSA will drive its transformation agenda and achieve a target of 65% proportional representation of employees from designated groups. The numerical target shall be achieved through the filling of vacancies, where concerted effort shall be on recruiting candidates from designated groups with a primary focus on the technical areas aiming to address gender imbalances, especially representation of black women. However, given the current financial environment non-critical personnel expansion efforts will be delayed.
8. Efforts will be continued to transform SANSA to a high performance organisation, including staff development initiatives, improved stakeholder engagement, financial sustainability, talent management, and business systems improvements.

PART A
STRATEGIC OVERVIEW

PART A: STRATEGIC OVERVIEW

VISION

South Africa to be an international hub for space solutions for the world of the future.

MISSION

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

STRATEGIC GOALS

SANSA has seven strategic goals as a means of achieving its mandate. The first five strategic goals are outward looking, focusing on the core programmatic areas of SANSA and have a national emphasis on the South African space landscape. These goals reflect SANSA's strategic intent to lead, coordinate and drive programmes in collaboration with national partners to achieve SANSA's legislated mandate and the attainment of key national priorities in line with the NSS and the National Space Programme (NSP). The two remaining strategic goals are inwardly focused and seek to ensure the sustainable growth of SANSA, whilst striving towards a high-performance Agency.

SANSA implements its seven strategic goals by clustering its activities along five broad strategic programmes as listed below:

Programme 1: Administration Programme,

Programme 2: Earth Observations Programme,

Programme 3: Space Science Programme,

Programme 4: Space Operations Programme, and

Programme 5: Space Engineering Programme.

Each of the programmes contributes in varying degrees to the strategic goals as indicated in the table below.

	Programmes				
Strategic Goals	**Administration**	**Earth Observation**	**Space Science**	**Space Operations**	**Space Engineering**
Address South Africa's challenges through space services and products		♦	♦		
Lead high-impact collaborative R&D on a national scale		♦	♦		
Develop national human capacity and ensure transformation		♦	♦	♦	♦
Enhance the competitiveness of the South African space industry		♦		♦	♦
Develop active global partnerships	♦	♦	♦	♦	♦
Ensure the growth and sustainability of SANSA	♦				
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 operational applications or solutions that will address national challenges through the provision of decision support tools for government. These include applications in natural resource management, climate change and environmental management, disaster management, rural development and urban planning, national safety and security. Achieving this strategic goal is in alignment with the DST strategic goal of accelerating inclusive development through scientific knowledge, evidence and appropriate technology. By contributing to these products and services and decision-support tools, SANSA strengthens or improves the delivery of various government services or functions. The primary objective is to ensure that space-based information is integrated into service delivery platforms, within industry and government, as indispensable tools for decision-making and policy formulation.

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

High quality impactful research and development leads to the development of sustainable space based applications that bring benefit to the nation. A close collaboration will be developed with various public and private sector institutions in South Africa, in areas of space science and technology to meet the broader user requirements of these sectors. SANSA is committed to the creation of new research and development initiatives to support the wider space community and promote the growth of innovative solutions through linkages with other government agencies. Therefore, SANSA will foster and lead collaborative research and development (R&D) in space related areas on a national scale. The prime objective is to increase the national research output in the space science and technology sector through supporting R&D initiatives.

Strategic Goal 3: Develop national human capacity and ensure transformation

For the national space programme to be sustainable, and deliver on its targets, there is a need to ensure that the appropriate skills base is in place. This will require SANSA to support building capacity in the STEM (science, technology, engineering, mathematics) areas and thus create the pipeline of students for developing the high-tech skills needed to meet national demand in the space sector. Capacity development in space related areas will not only benefit space, but will have a spill over effect into other productive sectors that require skilled scientists, engineers, and technicians. This will support the job creation priorities of the country and thereby strengthen the economic growth potential of South Africa. The primary focus will be on the development of high-end skills and expertise both for the space sector and other industrial sectors.

Strategic Goal 4: Enhance the competitiveness of the South African space industry

The global space industry is growing at a rapid rate and is estimated at over USD 300 billion. It is an industry that drives new technologies and innovation, giving rise to applications that go beyond space systems, for example, impacting sectors such as medicine, manufacturing, security, and energy. One of the objectives of the NSS is for South Africa to capture a reasonable share of the global space market, an endeavour that will create new opportunities and help grow the national space sector. This needs to be done in concert with other industrial policies and strategies, such as the Industrial Policy and Action Plan (IPAP). The primary focus will be on expanding space activities beyond the borders of South Africa to grow SANSA's market share of the global space sector.

Strategic Goal 5: Develop active global partnerships

Space science and technology, by its nature, can only be effectively undertaken as part of global partnerships. South Africa, through SANSA, must position itself as a strategic partner for the African continent and with other global players in space science and technology. In line with South Africa's foreign policy agenda, partnerships with African countries will be prioritised over the next five years through supporting the development of Science, Technology and Innovation (STI)

capacities in Africa. Internationally, SANSA will work with various partners, actively taking part in multi-national projects and forums, and continue to service a number of memorandums of understanding/agreements. SANSA will also enter into new strategic partnerships, at an inter-agency level, with a view to broadening access and creating opportunities for the national space sector. The primary focus will be on fostering international partnerships, both on the African continent and abroad, to unlock opportunities for the national space sector.

Strategic Goal 6: Ensure the growth and sustainability of SANSA

To adapt to the fast changing global space market and to meet the ever-changing socio-economic needs of the country, it is necessary for SANSA to grow in tandem and be sustainable over the long-term. This requires long-term commitment and strategic planning to ensure that the requirements of the users for space-based information, services and products are realised. A key issue in this regard is to ensure that SANSA begins to play a leading role in coordinating the national space programme within the broader national system of innovation. The primary focus is to ensure the growth and sustainability of SANSA, as success in this area equates to success of the national space programme.

Strategic Goal 7: Transform SANSA into a high performance agency

SANSA cannot achieve its objectives if it is not efficient and effective and this implies being a high performance organisation that is dependent on effective transformational leadership, strong human capital management, robust business planning and design, and operational and technological efficiency and effectiveness. All of these elements are central to the success of SANSA in meeting its national mandate and concerted attention will be paid to change management interventions to create an efficient and effective organisation. Such interventions will also extend to how we engage and interface with external stakeholders. The primary focus will be on ensuring that SANSA transitions into a high performing agency and becomes an employer of choice.

VALUES

The values adopted by SANSA are core to its effective transformation into a high performing agency. SANSA subscribes to the following six "STRIPE "values:

1. **Service through –**
    - Responding to communication and servicing requests appropriately and timeously,
    - Improving communication skills and capabilities in problem solving,
    - Delivering the right products or service on time every time,
    - Implementing and streamlining relevant systems and processes,
    - Striving for quality delivery to impact on humanity, and
    - Delivering customer value.
2. **Teamwork through –**
    - Establishing and communicating clear goals,
    - Speaking truthfully and listening to others,
    - Communicating purposefully, clearly, openly, appropriately and effectively,
    - Having regular team meetings for feedback about progress and share information,
    - Consulting, informing and sharing knowledge and resources, and
    - Communicating relevant issues, concerns, grievances formally.

3. Respect through –

- Greeting others,
- Treating others with fairness, dignity, mutual and reciprocal respect,
- Respecting other people's time and opinions,
- Respecting and tolerating personal beliefs which are different from my own,
- Respecting, recognising, acknowledging, accepting and celebrating others' achievements, and
- Acknowledging and valuing what is good

4. Integrity through –

- Being an example by acting in the right way,
- Honouring commitments,
- Keeping promises and owning up to mistakes,
- Adhering to policies and procedures,
- Holding others accountable, and
- Recognising integrity.

5. Personal Growth through –

- Acknowledging potential and growing competencies,
- Providing opportunities for learning and growth,
- Promoting skills development and skills retention,
- Empowering others through skills transfer,
- Taking responsibility for my own growth and supporting that of others, and
- Encouraging everybody to exploit development opportunities.

6. Excellence through –

- Doing tasks to the best of my ability at all times and going the extra mile,
- Seeking clarity and guidance,
- Making and implementing decisions after consultation,
- Continuing to improve on capabilities,
- Accepting authority,
- Adhering to policies and procedures and acting ethically, and
- Recognising, acknowledging and valuing what we do well.

SITUATIONAL ANALYSIS

The Current Global Space Environment

Introduction

The global space industry appears to be going through a period of reinvention, as evidenced by a variety of changes in the way it conducts operations. Efforts to reuse launch vehicles are beginning to bear fruit, and more efficient launch vehicles are being designed and developed, all of which may help to bring down launch costs. The satellite industry is seeing rapid growth in the number of small satellites, as vast constellations consisting of hundreds of satellites for Earth Observation and telecommunications are being ordered and built. Large satellites are taking advantage of more efficient propulsion systems that may help increase their usable lifespan. These are but a few examples of how the industry is making space more affordable and consequently more accessible to a broad swath of public agencies, industries, and individuals.

Space Products and Services

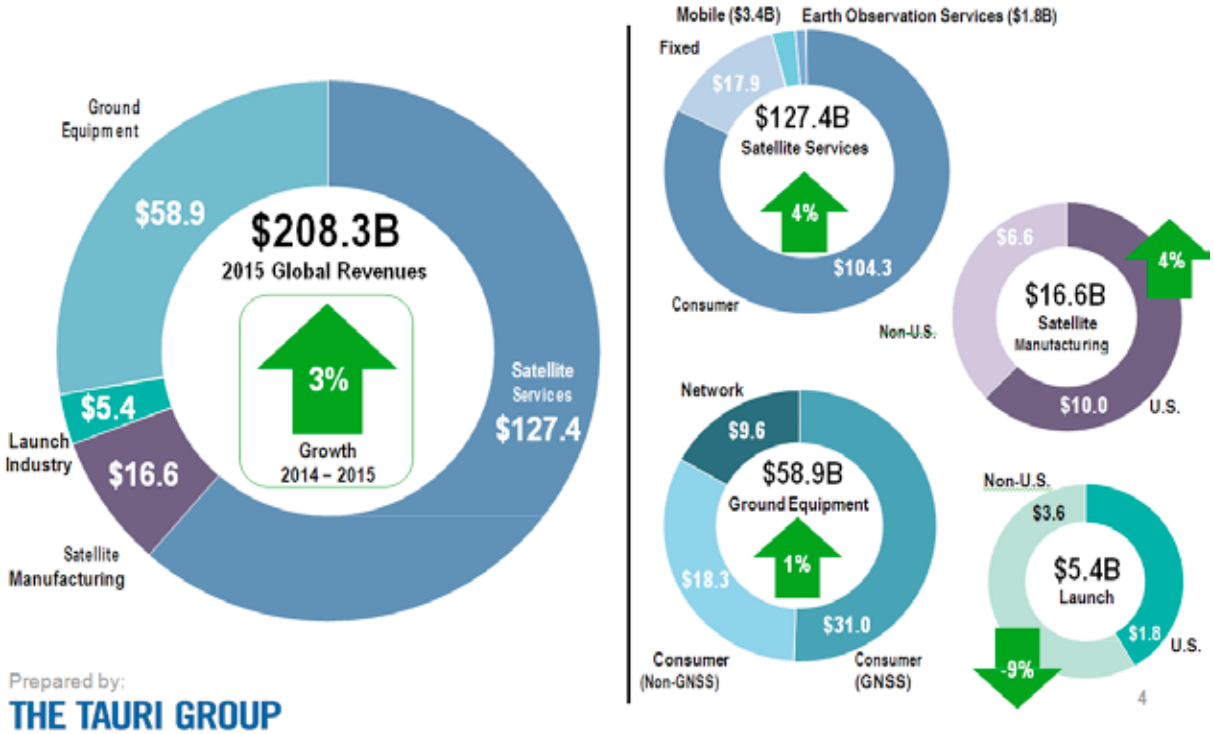
In other parts of the world where buildings do not always have an address, or road networks are confusing, smartphones with positioning, navigation, and timing (PNT) chips are facilitating delivery services for mail and packages. In war zones, drones equipped with PNT guidance systems are being used to supply refugees with life-saving supplies. On the consumer side, there are space-enabled systems to assist with finding prime locations for sports fishing and to help coaches improve the performance of soccer players. With the ongoing globalisation of food production, space systems are helping the shipping industry better monitor the condition of food in transit across the ocean to ensure that freshness is maintained all the way to the grocery store. The abundance of satellite imagery has led to an increasing number of space data analysis companies that help people understand their surroundings, whether for business or recreational purposes. The global demand for space data and applications is driving many of the recent investments in space.

The Global Space Economy

The global space industry grew in 2015, although currency fluctuations caused the appearance of a decline from $329 billion in 2014 to $323 billion in 2015. Due to the strong U.S. dollar and the ever-increasing levels of activity outside the United States, these fluctuations have a more noticeable impact than would have been the case in previous decades when the U.S. share of the commercial space industry was larger.

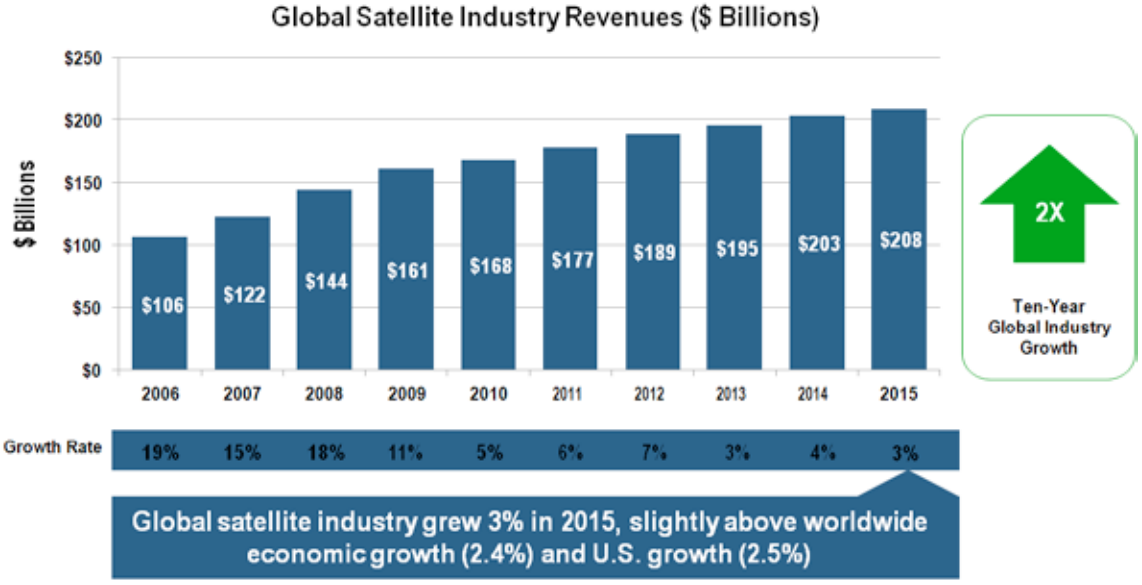
In 2015, revenues from commercial sectors continued to represent slightly more than three-quarters of all global economic activity in space. Commercial space products and services—including telecommunications, broadcasting, and Earth observation—constituted the largest sector, growing by 3.7% to reach $126.33 billion in 2015. Commercial infrastructure and support industries—including the manufacture of spacecraft, in-space platforms, and ground equipment, as well as launch services, independent research and development, and insurance—totalled $120.88 billion in 2015, a 5.2% decrease. The majority of this decline is attributable to global navigation satellite system (GNSS) receivers, whose revenues are benchmarked in Euros and subject to currency exchange fluctuations.

The figure below describes the 2015 satellite industry indicators summary (Tauri Group):



Global government space budgets declined by 4.8% in 2015, as spending totalled $76.52 billion. Government spending accounted for 24% of the global space economy, remaining unchanged from 2014. The U.S. government spent $44.57 billion on defence and non-defence space efforts in 2015, a 3.2% increase from 2014. Non-U.S. government space investment declined by 14.2% in dollar terms, primarily due to exchange rates, to a total of $31.95 billion in 2015. In reality, most countries increased their budgets for space activities.

The figure below describes the year on year global satellite industry revenues between 2006 and 2015 (Tauri Group):



Space Infrastructure

Governments and companies around the world continue to invest in new space infrastructure. At least 19 countries have, are developing, or are planning to host spaceports for orbital or suborbital launches. In spite of several launch failures and delays in launch services due to subsequent investigations in Russia and the United States, 86 orbital launches were attempted around the world in 2015—the third highest number of launches in two decades. China conducted the maiden flights of two new space launch vehicles in 2015, the Long March 6 and Long March 11. In 2016, China launched a third new vehicle the Long March 5.

In perhaps the most significant development for the launch industry, two U.S. companies successfully landed rockets that returned from space. Blue Origin's launch vehicle landed after a suborbital flight and subsequently flew to space and back on two occasions (as of May 2016). SpaceX returned the first stage of its Falcon 9 launch vehicle after an orbital launch, initially to a launch pad at Cape Canaveral. In later launches, the first stage landed on an oceangoing platform. Although none of the returned hardware has been flown again, the company hopes to reduce its operational costs by reusing the rockets. Reusability has been discussed as a way of lowering the cost of launching payloads to space, but it remains to be seen how much of an impact these developments will have on pricing and reliability.

Even at current prices, the number of large spacecraft launched into orbit annually remains steady, and interest in small satellites continues to grow unabated. With a mass of 10 kilograms (22 pounds) or less, nanosatellites constituted 48% of the 262 spacecraft launched in 2015. Looking at the past decade, the sudden rise of nanosatellites in 2013 means that the average number of spacecraft launched during the past three years is approximately double the average rate for the previous seven years. Despite their numbers, nanosatellites constituted less than 1% of the total mass sent to orbit in 2015. At the other end of the scale, telecommunications satellites launched to geosynchronous orbit made up 41% of the total mass, with an average mass of approximately 4,500 kilograms (9,920 pounds) per satellite. These satellites form the backbone for satellite communications and broadcasting services that generate more than $100 billion each year.

Satellite Services Findings

Fixed satellite services (FSS) grew by 15%

- Revenues for transponder agreements grew 1%, compared to 4% in 2014
- Revenues for managed services grew 15%, compared to 4% in 2014; airborne services contributed significantly

Mobile satellite services (MSS) grew 4%

- Mobile satellite voice revenues grew 9%, compared to 19% in 2014
- Mobile satellite data revenues grew 4%, compared to 27% in 2014
- Includes a small amount of revenue from Ku and Ka-band FSS capacity, leased by MSS operators to provide maritime, airborne, and other mobility services

Earth observation services revenues grew 10%

- Continued growth by established satellite remote sensing companies, with some new entrants reporting revenue from newly deployed and acquired satellites
- New entrants continued to raise capital, develop satellites, and deploy initial constellations

Space Industry Workforce

The space industry operates at the cutting edge and requires a highly skilled, highly trained workforce to build, launch, and utilise space assets. Trends in the size and composition of this workforce provide insight into ongoing dynamics and the future health of the sector. Programmers, computer scientists, and "big data" specialists are all finding increasing demand for their skills as companies seek to monetise the growing torrent of information flowing from and through space systems.

Global initiatives, such as the Group on Earth Observation (GEO) and the Committee on Earth Observation Satellites (CEOS), are important for space partnerships and the sharing of expertise and resources. South Africa is involved in these initiatives, and SANSA is the 2016/2017 chair of the CEOS Working Group on Capacity Building and Data democracy and the AfriGEO-SS whose plans will lead to better coordination of Earth observation initiatives on the African continent. SANSA and other national partners are contributing to this important initiative as led by the DST. This will promote South Africa's standing in the continent to facilitate the sharing of knowledge, resources and skills in Africa.

Below, is a list of some activities that SANSA does in support of AFRIGEOSS:

- Providing access to SPOT 2, 3 and 4 to SADC countries.
- Distributing a FUNDISA Disc version to SADC countries.
- Capacity Building activities in SADC with CEOS Working Group on Capacity Building and Data Democracy (WGCapD).
- Member of AfriGEOSS: Data dissemination coordination team.
- Plans to participate in the GEO SPOT Heritage Programme.
- Plans to distribute CBERS in African Countries starting with SADC.

SANSA's Interface in the NSI Landscape

Stakeholder Relations

SANSA has a significant footprint within the NSI and has linkages to six key stakeholder groups, namely:

i. Government departments with an interest in space-related activities, including but not limited to the DST, to which the Agency reports;

ii. Government departments and entities that fulfil some agency function e.g. funding agencies;

iii. Government departments and entities that SANSA supports in one form or the other;

iv. Partner R&D institutions;

v. Industry partners and clients; and

vi. Students, educators and the public.

National Development Plan and MTSF

Government has adopted the 2014 - 2019 **Medium-Term Strategic Framework (MTSF)** to be used as the first five-year building block towards realising the **Vision 2030** in the **NDP**. The MTSF lists 14 key outcomes with associated activities and targets to be achieved by 2019. There are eight outcomes that are impacted by key activities of SANSA and these are presented on the graphic that follows.

Outcome 1: Quality Basic Education	• Improve the uptake of STEM subjects • Outreach to rural schools
Outcome 3: All people in South Africa are and feel safe	• Satellite imagery for defence support • Geospace and geomagnetic information for defence • Space weather services for defence • Electromagnetic services for defence • Navigation services for defence
Outcome 4: Decent employment through inclusive economic growth	• Support of external jobs through the satellite programme • Student training to increase employability
Outcome 5: Skilled & capable workforce to support an inclusive growth path	• Student training • Partnerships with universities and R&D institutions • Provision of student training resources to universities and R&D institutions • Research programmes • Hands-on and internship training
Outcome 7: Vibrant, equitable, sustainable rural communities contributing towards food security	• Cropwatch4SA • Support to DAFF, ARC • Rangelands project • Water projects
Outcome 8: Sustainable human settlement & improved quality of household life	• Human settlement information and services • Geospatial planning • Support for electricity provision • Support for water provision
Outcome 10: Protect & enhance our environmental assets & natural resources	• Environmental management resources • Sustainable development planning • Earth science research
Outcomes 9 and 12: Effective & efficient local government and public service	• Decision support tools • Applications and services that facilitate service delivery • Public sector training

The Nine-Point Plan

During his State of the Nation Address in Parliament in Cape Town in February 2015, President Jacob Zuma, among other things, announced a Nine-Point Plan to grow the economy and create much-needed jobs.

The Nine-Point Plan was intended to address key challenges that affect South Africa, which includes:

- The electricity challenges;
- Inadequate economic infrastructure in general;
- Unwieldy regulatory processes that delay investment; and
- Insufficient government coordination, which contribute to investor uncertainty.

The components of the Nine-Point Plan are the following;

- Revitalising the agriculture and agro-processing value-chain;
- Adding value to our mineral wealth (advancing beneficiation and support to the engineering and metals value-chain);
- More effective implementation of the Industrial Policy Action Plan;
- Unlocking the potential of small, medium and micro enterprises, cooperatives and township enterprises;
- Operation Phakisa (Oceans Economy, Mining, Health, Tourism, Basic Education, etc)
- Encourage private sector investment;
- Resolve the energy challenge;
- Moderating workplace conflict; and
- State reform and boosting the role of state-owned companies, information and communications technology infrastructure or broadband roll-out, water, sanitation and transport infrastructure.

The recent inclusion of Science, Technology and Innovation (STI) as a crosscutter in government's 9 Point Plan shows that in line with the Department's strategic outcome orientated goals, STI also contributes in addressing socio-economic challenges. SANSA's APP 2017/18 will contribute to the NINE POINT PLAN as discussed below.

SANSA's contribution to the Nine Point Plan

Supporting and directing the National System of Innovation and mandating publicly- funded STI institutions to support government priority outcomes through

- Development of long-term strategies for the satellite programme.
- Reviewing long-term strategies for Earth Observation such as the National Space Programme.
- Creating an enabling environment through the provision of key satellite datasets and value-added products.
- Collection and consolidation of national user requirements.
- Conducting international conferences and workshops in Earth observation.
- Representing South Africa in international Earth observation forums such as CEOS and GEO.
- Funding post-graduate studies in Earth observation.
- Space Science supporting the development of research capacity through funding human capital development at post-graduate level, expanding and transforming research capacity and providing infrastructure including cyber infrastructure for entities and higher education institutions.

Developing research capacity through funding human capital development at postgraduate level, expanding and transforming research capacity and providing infrastructure including cyber infrastructure for entities and higher education institutions

- Conducting short training courses and provision of bursaries.
- Provision of free datasets and open source software for training.
- Establish of an educational Fundisa web portal for student learning.
- Funding post-graduate studies in Earth observation.
- Support 350 space science postgraduate students and interns by March end 2020.

Using research, development and innovation to enhance the productivity of priority sectors such as mining, agriculture and manufacturing

- Implementation of crop and rangeland monitoring systems e.g. Crop-watch and GEOGLAM.
- Implementation of collaborative projects to monitor the mining district life cycle.
- Implementation of the human settlements monitoring system.
- Implementation of the water resources monitoring system.

Using knowledge and innovation for economic development as well as identifying and piloting projects that have potential for economic development and growth

- Provide spatial and temporal information for crop and rangeland conditions, yield prediction, financing and insurance purposes.

Using technology, infrastructure and knowledge in scientific institutions to enhance economic competitiveness

- Using IT infrastructure for satellite archiving and dissemination as the national Earth observation data centre.
- Usage of satellite derived information and web mapping services to support policy implementation and decision making in government.
- Application satellite information to support spatial planning.
- Application of satellite derived crop information to ensure food security and agricultural marketing information.

Identifying gaps and use of technology and research to support and grow SMMEs

- Provide access to open and free satellite data to SMMEs.
- Short training courses targeted towards SMMEs.
- Collaborative partnerships with SMMEs in local and internationally funded projects e.g. UK Space Agency Calls and Horizon 2020 calls.
- Procurement of products and services from SMMEs within the confines of the PFMA.
- Identification of potential incubation partners.
- Satellite programme support for SMMEs.

Supporting the commercialisation of ideas from research

22 national high-impact operational space related products and applications by end of March 2020. This includes:

- Space weather products and services.
- HF Propagation Prediction Services.
- Space Weather Monitoring & Alerts.
- Space Weather Training Course.
- Space Weather Support Tools.
- Magnetic Technology products and services.
- Compass Calibrations.
- Magnetic Navigation Ground Support Services:
    - Magnetic Field Model Maps.
    - Magnetic Sensor Sourcing and Calibration Aircraft Compass Swing facilitation and training.
    - Magnetic and electrical field measurements and management.

Using knowledge and innovation for inclusive development

- Innovation competitions, workshops and funding.
- Provision of free satellite datasets.
- Partnering with TIA and the Innovation Hub to identify commercialisation concepts, people, funds and incubation partners.
- Potential opportunities from satellite development – sub systems Space Science commercialisation.

Using science to inform policy

Policy brief in all Earth-observation societal benefit areas, such as human settlements, water, food security (agriculture), and disasters.

Implementation of geospatial systems that support environmental policies with inherent spatial components.

Addressing the Triple Challenges

There is a need for the science system to address the **triple challenges of inequality, poverty and unemployment.** SANSA will address issues of inequality internally by striving for equity, particularly gender balance in the technical areas of the business. At a national scale, SANSA will contribute to a transformative skills development programme. The Agency will address issues of poverty through the various programmes that contribute to food security, water management, natural resource and environmental management, energy security and disaster mitigation. While SANSA and the space industry in general are not labour intensive, the Agency will continue to create high-end skilled employment opportunities within the space sector through the various initiatives implemented by SANSA.

For the employment opportunities, created through these initiatives, SANSA will strive to meet the national employment equity targets for the space sector. Furthermore, the Agency will continue with ongoing efforts to support and absorb young graduates through the existing human capital development programmes, which include the SANSA bursary scheme and the internship programme. The challenge though is the permanent absorption of these trained interns and graduates within SANSA and the broader space sector in the current depressed economy where the year-on-year growth of the sector is minimal. The figure illustrates how SANSA contributes to the Triple Challenges.

Inequality

- 65% representation of permanent staff from designated groups in the D to F grades by end March 2020. (Goal 7)
- Support 75 postgraduate students with 80% of these students from previously disadvantaged communities (Goal 3).
- Directly engage 9000 young students through science awareness & outreach activities with a focus on previously disadvantaged communities (Goal 3)

Poverty

- Deliver Human Settlement Planning solutions that will improve the quality of lives of its citizens. SANSA has developed a national human settlements mapping tool. (Goal 1)

Unemployment

- A total of 55 direct jobs supported externally through SANSA satellite built programme contracting (Goal 4)
- A total contract expenditure of R13 million to be outsourced to SMEs for core space projects (Goal 4)

National Space Strategy

The NSS is a national road map and implementation framework for a viable and sustainable national space programme. The NSS, as approved by Cabinet in 2008, sets national goals and objectives for space science and technology. The table below indicates the alignment of SANSA's strategic goals with the objectives of the NSS.

No	National Space Strategy Objectives	SANSA's Goal Alignment
1	Developing the local private space science and technology industry sector	Goal 4
2	Developing services and products that can respond to user needs	Goal 1
3	Satellite or services offered from existing facilities	Goal 1 and 2
4	Organising some of the current space science and technology activities into strategic programmes	Goal 2
5	Optimising the organisation of future space activities to respond to opportunities with international industrial partners or international space agencies	Goal 5
6	Partnerships with established and developing spacefaring countries for industrial and capacity development purposes	Goal 2, 3 and 5
7	Strengthening training and technology transfer programmes, including the sharing of experience and expertise	Goal 3 and 4
8	Promoting space science and technology in academic institutions and science centres and the provision of opportunities for both short-term and long-term training and education	Goal 3
9	Responding to challenges and opportunities in Africa	Goal 5
10	Advocating the importance of space science and technology as a priority measure for meeting national development needs	Goal 1 and 3
11	Building local awareness of space science and technology	Goal 1, 2, 3 and 4, 6,7

Alignment to the DST Priorities

SANSA reports to the DST and contributes to the DST key priorities as follows:

Key DST Output	SANSA Contribution
Knowledge Outputs	Achieve a research productivity score of 1500. This is a composite score of research publications, research grants sourced, research student graduated and research ratings. (Goal 2)
Knowledge Applications Products	Produce the following: 2 national geospatial information mosaics; national flood risk map, human settlement map, water base map, and vegetation base map; daily space weather bulletins; High Frequency predictions for communication; calibration of 25 navigation compasses for aviation. (Goal 1)
Decision Support Interventions	Produce 3 policy briefs covering the following: (i) Earth Observation and Food Security; (ii) Safety and security applications from a magnetically clean environment, (iii) The Size and Health of the South African Space Programme and Proposed Growth. (Goal 1)
Postgraduate Student Training	Support 75 students with a drive on race and gender equity. (Goal 3)
Leveraging Partnerships	Generate an equivalent of 3% of SANSA's non-commercial operating revenue through partnerships.
Commercial Outputs	Generate R60 million through commercial or contractual arrangements. A total contract expenditure of R13 million to be outsourced to SMEs for core space projects. (Goal 4)

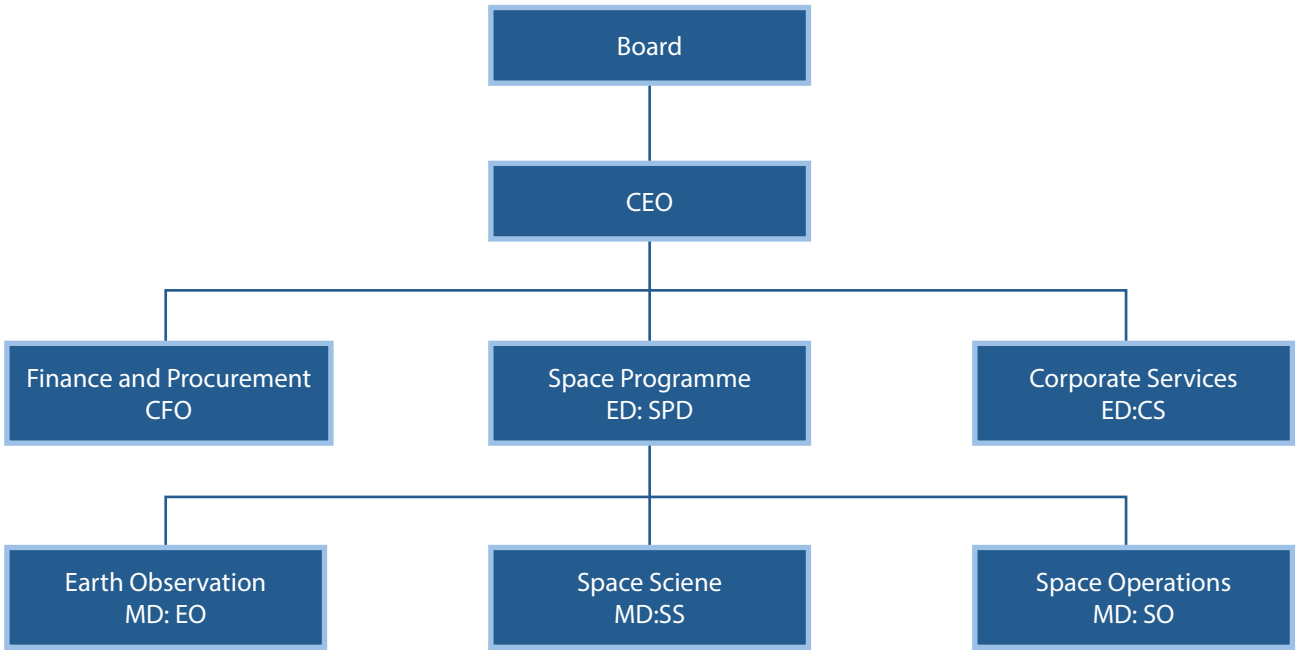
National Space Programme (NSP)

The NSS sets the national goals and objectives for space science and technology. In line with the NSS, a coherent National Space Programme (NSP 2030) was formulated through a national consultative process. This plan defines various programmes and an associated technology road map for the next two decades leading up to 2030. The NSP 2030 consists of the National Earth Observation Programme (NEOP), the National Space Science Programme (NSSP), the National Space Engineering Programme (NSEP) and the National Space Operations Programme (NSOP). The NSP sets project and resourcing priorities; clarifies institutional interfaces and highlights high-level outputs and measures of success for the South African space programme. Implementation of a number of these programmes is well underway even though formal approval of the NSP 2030 is still pending.

SANSA Organisational Structure

To deliver on its mandate, SANSA is structured into the following programmes:

- SANSA Administration Programme:
- SANSA Earth Observation Programme;
- SANSA Space Operations Programme;
- SANSA Space Science Programme;
- SANSA Space Engineering Programme;



REVISIONS TO LEGISLATIVE AND OTHER MANDATES

The South African National Space Agency legislation and other mandates that directly relate to SANSA have not changed. However, the Space Affairs Act (Act 83 of 1993) is being redrafted and Cabinet approval thereto will be sought in 2017/18. Material changes are expected with respect to regulations affecting the national space industry. Such changes will be considered during the implementation phase of SANSA's programmes and activities that involve the local space industry.

CONSOLIDATED PERFORMANCE OUTPUTS

The tables below present the consolidated performance outputs of SANSA for the seven strategic goals over the period 2015 to 2020.

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Strategic Plan Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 1: Address South Africa's challenges through space services and products	S1.1 Lead and facilitate the creation of high-impact products and services to address society's needs and challenges	M1.1 The number of national high-impact products and services	T1.1 Total of 24 national high-impact operational space related products & services by end March 2020	4 (Target – 4)	5 (Target – 5)	5	5	5
	S1.2 Provide government with effective policy or decision tools and support	M1.2 The number of government decision or policy support tools	T1.2 Total of 14 decision or policy support tools by end March 2020	2 (Target – 2)	3 (Target – 3)	3	3	3
Goal 2: Lead high-impact collaborative R&D on a national scale	S2.1 Increase the national space research output	M2.1 The national research productivity score for space support R&D (This productivity score is based on a function of research funding sourced + publications (journals, books, reports, proceedings) + students graduated + research rating status)	T2.1 Research productivity score of 2000 per annum by end March 2020	1992 (Target – 750)	950 (Target – 950)	1200	1600	2000

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Strategic Plan Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 3: Develop national human capacity and ensure transformation	S3.1. Increase youth awareness of science	M3.1 The number of youth directly engaged through science awareness & outreach activities (This excludes arms-length engagement with the youth e.g. a visit to one of SANSA's exhibition stands)	T3.1 Total of 57500 young people directly engaged through science awareness & outreach by end March 20201	18 769 (Target - 8000)	9000 (Target – 9000)	12000	13500	15000
	S3.2 Support students with a transformation agenda	M3.2 The number of PDI students supported for formalised training (This excludes short courses and focuses on students that are registered for some formal training for a degree, diploma, or certificate within the South African National Qualification Framework)	T3.2 Total of 350 students supported at a proportion of 80% PDI students supported annually for formalised training	53 (Target - 40)	50 (Target – 50)	75	90	100
				Target introduced in 2017/18	Target introduced in 2017/18	PDI Target 60	PDI Target 72	PDI Target 80
				Target introduced in 2017/18	Target introduced in 2017/18	PDI Proportion 80%	PDI Proportion 80%	PDI Proportion 80%

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 4: Enhance the competitiveness of the South African space industry	S4.1. Generate greater benefit for the space programme through space operations activities	M4.1.1: Successful satellite pass monitoring rate for Earth observation	T4.1.1 Successful satellite pass monitoring rate of 98% per year for Earth observation by end March 20202	Successful Passes 42 686	Successful Passes 4190	Successful Passes 4412	Successful Passes 4412	Successful Passes 4412
				Actual Passes 42 833	Estimated Passes 4275	Estimated Passes 4500	Estimated Passes 4500	Estimated Passes 4500
				Actual Monitoring Rate 99.7% (Target - 97%)	Estimated Monitoring Rate 98% (Target -98%)	Monitoring Rate 98%	Monitoring Rate 98%	Monitoring Rate 98%
		M4.1.2: Total income generated from space operations activities	T4.1.2 Total commercial income of R267 million over five years generated from space operations by end March 20203	R77 million (Target - R58 million)	R60 million (Target – R60 million)	R44 million	R50 million	R55 million
		M4.1.3: The proportion of space operations commercial international income invested in other SANSA programmes	T4.1.3 A total of 5% of space operations commercial international income invested in other SANSA programmes	R20 million (Target – R10.2 million)	R11 million (Target – R11 million)	R2.2 million	R2.5 million	R2.8 million
				Target introduced in 2017/18	Target introduced in 2017/18	Total Target Income R44 million	Total Target Income R50 million	Total Target Income R55 million
				Target introduced in 2017/18	Target introduced in 2017/18	Target Proportion 5%	Target Proportion 5%	Target Proportion 5%

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 4: Enhance the competitiveness of the South African space industry	S4.2 Grow the national space industry	M4.2.1 The number of direct jobs supported externally through SANSA programme contracting	T4.2.1 A total of 55 direct jobs supported per year externally through SANSA programme contracting	53 (Target 40)	50 (Target – 50)	55	55	55
		M4.2.2 The achievement of key project milestones in the EO-Sat1 development	T4.2.2 The achievement of key project milestones in the EO-Sat1 development (modification to be implemented 2017/18)	21% (Target - 25%)	50% (Target – 50%)	Preliminary Design Review (PDR) completed for the Space System in preparation for Critical Design review in 2018/19	Critical Design Review (CDR) completed for the Space System Flight Model	Completion of the qualification phase and Flight model Phase in preparation for launch in late 2020
		M4.2.3 The total contract expenditure to SMEs for core space projects	T4.2.3 A total contract expenditure of R66.2 million for core space projects	R7.8 million (Target – R10 million)	R12 million (Target – R12 million)	R14.2 million	R15 million	R15 million
		M4.2.4 The total contract expenditure to the broad space related industry for core space projects	T4.2.4 The total contract expenditure of R310 million to the broad space related industry for core space projects	R98.1 million (Target – R50 million)	R55 million (Target – R55 million)	R65 million	R67 million	R73 million

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 5: Develop active global partnerships	S5.1.Leverage a significant benefit for the space programme through global partnerships	M5.1 The equivalent revenue generated through partnerships as a proportion of the SANSA non-commercial operating revenue	T5.1 Global partnerships contributing an equivalent of 3% to the SANSA non-commercial operating revenue per year	2% (Target - 5%)	2% (Target – 2%)	3%	3%	3%
Goal 6: Ensure the growth and sustainability of SANSA	S6.1. Ensure that SANSA has annual measurable growth and is sustainable	M6.1 Total non-ring-fenced SANSA revenue	T6.1 Total SANSA non-ring-fenced revenue of R1,222 billion by end March 2020	R238 million (Target - R223 million)	R237 million (Target – R200 million)	R251 million	R266 million	R282 million

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 6: Ensure the growth and sustainability of SANSA		M6.2 Estimated monetised impact from space related activities5	T6.2 Estimated monetised impact from space related activities by end March 2020	R299 million (Target - R100 million)	Target revised in 2016/17 to a qualitative output target	Analysis, interpretation of key data Develop complete analytical model on quantification of space value. The Model will allow for dynamic changes to the industry. Finalise report on the monetised impact of space related activities.	Target to be revised in 2018/19	Target to be revised in 2018/19
		M6.3 SANSA's stakeholder awareness	T6.3 SANSA's national stakeholder awareness of 90% by end March 2020	93% (Target - 50%)	60% (Target – 60%)	70%	80%	90%
	S6.2. Ensure the effective implementation of the NSP	M6.4. High-level NSP implementation progress status	70% of the NSP projects are active by end March 20206	52% (Target - 30%)	40% (Target – 40%)	50%	60%	70%

2015/2020 Strategic Outcome Oriented Goals – Annual Targets				Audited Actual Performance	Estimated Performance	Medium-Term Targets		
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Five-Year Target**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**
Goal 7: Transform SANSA into a high performance Agency	S7.1. Ensure that SANSA has been optimised for high performance	M7.1 Implementation of identified initiatives that enhance organisational performance	T7.1 Total of 20 identified initiatives fully implemented by end March 2020	Actual 4 (Target – 4)	Estimated 4 (Target – 4)	4	4	4
		M.7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	T.7.2 65% Proportional (%) representation of permanent staff from designated groups in the D to F grades or top two Management Levels by end March 2020	Actual 71% (Target - 65%)	Estimated 65% (Target – 65%)	65%	65%	65%
		M.7.3 Proportional (%) of total operating expenditure invested in staff training & development	T7.3 1.5% of total operating expenditure invested in staff training & development by end March 2020	Indicator introduced in 2017/18	Indicator introduced in 2017/18	1%	1%	1.5%

ALIGNMENT OF SANSA OUTPUTS TO KEY NATIONAL PRIORITIES

CONSOLIDATED RESOURCE CONSIDERATION

Overview of 2017/18 Budget and Medium Term Expenditure Framework (MTEF)

Expenditure estimates

Table 3.1 South African National Space Agency expenditure trends and estimates by programme

Programme	Audited outcome				Revised estimate	Medium-term expenditure estimate			Total MTEF
R thousand	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Corporate Support	38 410	37 137	49 446	38 802	39 002	40 525	41 840	44 795	127 160
Earth Observation	57 197	56 357	97 495	69 601	72 164	76 514	80 309	84 185	241 008
Space Operations	57 724	86 084	74 308	47 442	47 022	48 285	52 008	55 503	155 795
Space Science	37 894	39 122	36 291	33 779	35 125	35 059	36 661	37 599	109 319
Space Engineering	17 858	27 572	56 978	91 387	102 653	114 681	12 657	13 366	140 704
Total	**209 083**	**246 272**	**314 518**	**281 011**	**295 966**	**315 065**	**223 475**	**235 448**	**773 986**

Table 3.2 South African National Space Agency expenditure trends and estimates by economic classification

Economic classification	Audited outcome				Revised estimate	Medium-term expenditure estimate			Total MTEF
R thousand	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Compensation of Employees	62 729	75 093	90 265	103 305	111 703	120 516	129 433	138 455	388 404
Goods and Services	114 026	124 602	136 793	90 683	83 423	85 271	84 073	86 641	255 984
Payments for Capital Assets	32 328	46 577	87 460	87 023	100 840	109 278	9 969	10 351	129 598
Total Expenditure	**209 083**	**246 272**	**314 518**	**281 011**	**295 966**	**315 065**	**223 475**	**235 448**	**773 986**

The projected total annual funding for SANSA is R315 million in 2017/18, R223 million in 2018/19 and R235 million in 2019/20 with a total of R774 million over the medium term. The decline in the annual projections from 2018/19 related to the additional satellite development programme funding not yet confirmed by the department.

In line with strategic Goal 1, to address South Africa's challenges through space-related services and products spending over the medium term will be focused on ensuring that space is integrated into service delivery, and is an indispensable tool of government decision and policy formulation by providing space-related services and products so as to address challenges in the agricultural; water; aviation, energy & health, safety & security industries. The Earth Observation and Space Science Programmes will largely contribute to this strategic objective and they account for 35 percent of expenditure over the medium term reaching R350 million by 2019/20.

Strategic Goal 2 is to lead high-impact collaborative R&D on a national scale. Expenditure related to collaborative research over the medium term is mainly from project specific research grants that are competitively applied for and salaries for researchers. This is estimated at ***R42.8 million*** over the medium term and is mostly led by the Space Science Programme.

In meeting Goal 3, which is to develop national human capacity and ensure transformation, ***R15 million*** over the medium term, is allocated to support 260 students in space related areas through bursaries and student supervision to contribute to better quality of research outputs and increased number of space-related research publications produced.

Strategic Goal 4 is to enhance the competitiveness of the South African space industry. The Space Operations and Space Engineering Programmes are the key drivers for this objective. The space operations activities are estimated to cost R155 million over the medium term, with average annual expenditure of R52 million. These activities are conducted largely to service the international commercial market and also provide ground support infrastructure maintenance for telemetry services to enable remote sensing processes in the acquisition of satellite data and imagery. As the primary driver of the Agency's industry development initiatives, the satellite build programme has an allocation of ***R140 million*** over the medium term. The decrease in expenditure in the 2018/19 year in the Space Engineering Programme is as a result of the current approved funding of R450 million allocated from the inception of the satellite build programme in 2011, reaching its ceiling of the R450 million in year 2018/19.

Strategic Goal 5 is to develop active global partnerships. A large part of the cost is related to travel local and internationally as well as hosting and participating in space related conferences and seminars**.** ***R15 million*** is allocated over the medium term for these activities.

Strategic Goal 6, which is to ensure the growth and sustainability of SANSA and Goal 7 to transform SANSA into a high performance Agency are driven by the Administration Programme. ***R127 million*** has been allocated over the medium term to drive initiatives that will enhance revenue growth and institutional performance.

Expenditure by economic classification

The Agency derives its revenue from transfers from the DST. The parliamentary grant is estimated to increase only by 5% over the medium term. Other sources of revenue include interest earned on investments, rendering services and other income. Contract revenue is thus expected to grow over the medium term by 3% as a result of a limited scope in terms of providing mandate work at a fee from state institutions, fixed term hosting contracts from international clients reaching their term end and the inability to project for launch support revenues as these are dependent of the success of the launches.

Compensation of employees remains one of the significant drivers of expenditure contributing 38 % to enable the Agency to source scientists, engineers and researchers in the space science industry to support its mandate as well as the satellite build programme. The head count on permanent staff will marginally increase from 190 in 2017/18 to 192 in 2019/20 in order to remain within budget.

Expenditure on goods and services contributes to 27% of the total budget, and noticeably decreases over the medium term. This is due to total transfers over the medium term decreasing by 11% coupled with a marginal increase of only 3% on contract revenue, whereas personnel costs increase at an average of 7.3% over the medium term. The decrease in income directly causes the available budget for goods and services to decrease over the medium term. The impact of the decrease will affect the institution's ability to source satellite imagery and to effectively maintain and operate SANSA's facilities.

Payments for capital assets constitute 35% of the total budget over the medium term and are largely for the satellite build programme. The satellite programme funding is not yet confirmed beyond 2017/18, hence the substantial reduction in projections in the two outer years. This will have an impact on the completion and commissioning of the satellite.

ENTERPRISE RISK MANAGEMENT PERIOD 2017/18

Enterprise Risk Management (ERM) is now established within the organisation and is applied across the organisation in line with the Board's approved ERM Policy and Framework. The SANSA ERM plan and strategic risk register are reviewed and approved annually by the Board, to ensure alignment with the strategic goals of SANSA. ERM awareness is also conducted to promote a risk management culture throughout SANSA.

ERM has also implemented necessary policies, prevention plans and awareness sessions to assist the organisation to counter fraud and corruption.

The table below highlights the identified risks and some of the associated control measures as per the SANSA Strategic Risk Register.

				Inherent Risk			
	SANSA Objective	**Risk Description**	**Consequences of Risk**	**Impact**	**Likeli-hood**	**Rating**	**Current Controls**
1	Goal 4 & 5	Inability to execute and deliver on the objectives; i.e. EO-Sat 1 Satellite program and Industry Development	1. Inadequate Satellite program 2. No Competitive Space Industry 3. Unable to develop the required human capital to capacitate the space programme 4. Unable to develop required technologies to give SA Space Industry the global competitive edge 5. Extended delays to the satellite program 6. Financial losses	5	5	25	1. Continuous Engagement with the Department of Science and Technology (DST) for increased funding 2. Industry Development and Localisation Policy in place to guide in developing the industry 3. National Space Strategy in place 4. User Specification requirements have been developed and discussed with the contactors 5. Life Cycle Costing estimation completed and approved by the Board 6. Managing the Industry Development process and localisation through the EO-Sat1 contract 7. SANSA to complete an analysis on the absolute minimum cost for the acquisition of the EO-Sat1 system to be presented to the DST 8. Prepare the annual programme plan which will indicate to DST the resource challenges for the next financial year
2	Goal 6 & 7	Current SAP system functionality not adequate	1. Poor Management Information 2. Too many manual interventions 3. Time consuming tasks 4. Audit queries 5. Financial losses as a result of errors 6. Delays in reporting 7. Inaccuracy in reporting.	5	5	25	1. Manual processes in place to supplement the SAP system 2. Escalate the issues to ICT and the service provider 3. Implementation of the new ERP system underway 4. Finance staff and all the relevant staff taking part on the project to ensure that the financial control and system procedures are implemented correctly

				Inherent Risk			
	SANSA Objective	**Risk Description**	**Consequences of Risk**	**Impact**	**Likeli-hood**	**Rating**	**Current Controls**
3	Goal 1, 2,3,4, 5, 6 &7	The planned organisation-al re- design may lead to unintended change man-agement challenges	1. Failure to achieve SAN-SA strategic goals 2. Poor staff morale 3. Misalignment to the SANSA strategy 4. Low produc-tivity related to the change process de-mands.	5	5	25	1. Preliminary organisational design plan has been devel-oped and presented to the Board 2. Senior Management engagement around the organisational design
4	Goal 7	Non-com-pliance relating to procurement of goods and services	1. Irregular and fruitless expenditure 2. Disciplinary action leading to dismissals or imprison-ment 3. Reputation-al damage to SANSA's brand 4. Financial losses	5	4	20	1. Ad-hoc memos to advise of any changes to the policies 2. Checklist in place to con-firm compliance before purchase order can be generated 3. Appointment of a service provider to assist with the Irregular Expenditure inves-tigations

				Inherent Risk			
	SANSA Objective	**Risk Description**	**Consequences of Risk**	**Impact**	**Likeli-hood**	**Rating**	**Current Controls**
5	Goal 1, 2,3,4, 5, 6&7	Failure to reach the 80% minimal threshold of SANSA annual performance targets	1. Failure to meet shareholders compact as agreed with the Minister 2. Inability to demonstrate impact and shareholder's return 3. Loss of public value and return 4. Loss of credibility as a key player in the space industry 5. Loss of fund-ing 6. Financial un-sustainability	5	3	15	1. Ongoing engagement with key stakeholders regarding funding, i.e. Department of Science and Technology (DST) 2. Communication and roll-out of the strategy and the annual performance plan. (Annually) 3. Quarterly reporting on performance 4. Finalise and submit the Financial Sustainability Framework and Strategy for SANSA to the Board for approval
6	Goal 1,2& 7	Insufficient disaster re-covery plans for infra-structure to support the organisation in case of disruptions in enterprise systems	1. Disruption to business operations 2. Inability to provide services 3. Increased costs of acquiring and processing data 4. Reputation damage to SANSA 5. Difficulties in retrieval of data	5	3	15	1. Systems replicated between directorates. 2. Running virtual server envi-ronment to enable redun-dancy for business systems 3. Daily, weekly and monthly back-ups are performed. Physical tapes for director-ates are stored at SO in fire proof safe 4. Warranty is in place on the hardware 5. Anti-virus and firewalls in place across SANSA 6. Archive and back up reten-tion policy in place 7. Develop a cost for IT busi-ness and disaster recovery plan for SANSA

				Inherent Risk			
	SANSA Objective	**Risk Description**	**Consequences of Risk**	**Impact**	**Likeli-hood**	**Rating**	**Current Controls**
7	Goal 1, 2, 4,5, 6 &7	Inability to maintain and replace infra-structure	1. Loss of in-come 2. Loss of credi-bility (reputa-tional risk) 3. Failures to ful-fil the SANSA mandate 4. Increase replacement and replace-ment costs 5. Repudiated claims	5	3	15	1. Insurance in place for infra-structure 2. Good maintenance practice and plan in place 3. Redundancy plan docu-mented and implemented (System Architecture Risk Assessment) 4. The Computerised Mainte-nance Management System (CMMS) 5. Funding challenges escalat-ed to EXCO 6. There is a process in place to notify clients of any downgraded services
8	Goal 1, 2,3,4, 5, 6&7	Inability to achieve SAN-SA strategic goals due to inadequate employees with capabili-ties to deliver on SANSA's goals.	1. Overworked staff 2. Low staff morale 3. Poor perfor-mance 4. High staff turnover 5. Staff produc-tivity 6. Business sus-tainability 7. Dysfunctional corporate culture 8. Disengaged employees	4	3	12	1. Annual remuneration sur-veys to benchmark against the market 2. Performance Incentive scheme 3. Career framework to determine career paths for employees 4. Annual Job evaluations as and when required by line management 5. Policy in place for critical and scarce skills 6. Workforce plan in place that also incorporates succes-sion planning and recruit-ment plans 7. Training and personal development plans in place for staff as part of perfor-mance management and development

				Inherent Risk			
	SANSA Objective	**Risk Description**	**Consequences of Risk**	**Impact**	**Likeli-hood**	**Rating**	**Current Controls**
9	Goal 6 & 7	Inadequate institutional performance manage-ment processes to support the SANSA strategy	1. Unable to ac-curately mea-sure SANSA performance against set objectives 2. Audit find-ings against SANSA 3. Reputational Risk 4. Possible under/ over achievement against tar-gets 5. No pro-gress made towards achievement of summative targets	4	3	12	1. Progress towards achieve-ment of targets is moni-tored quarterly through the submissions. 2. Key Performance Indica-tor descriptors in the KPI Reference Manual in place where all the indicators are defined 3. Quarterly performance re-view meetings are present-ed to the Board 4. Internal Audit review of the reported information

PART B
PROGRAMME PERFORMANCE PLANS

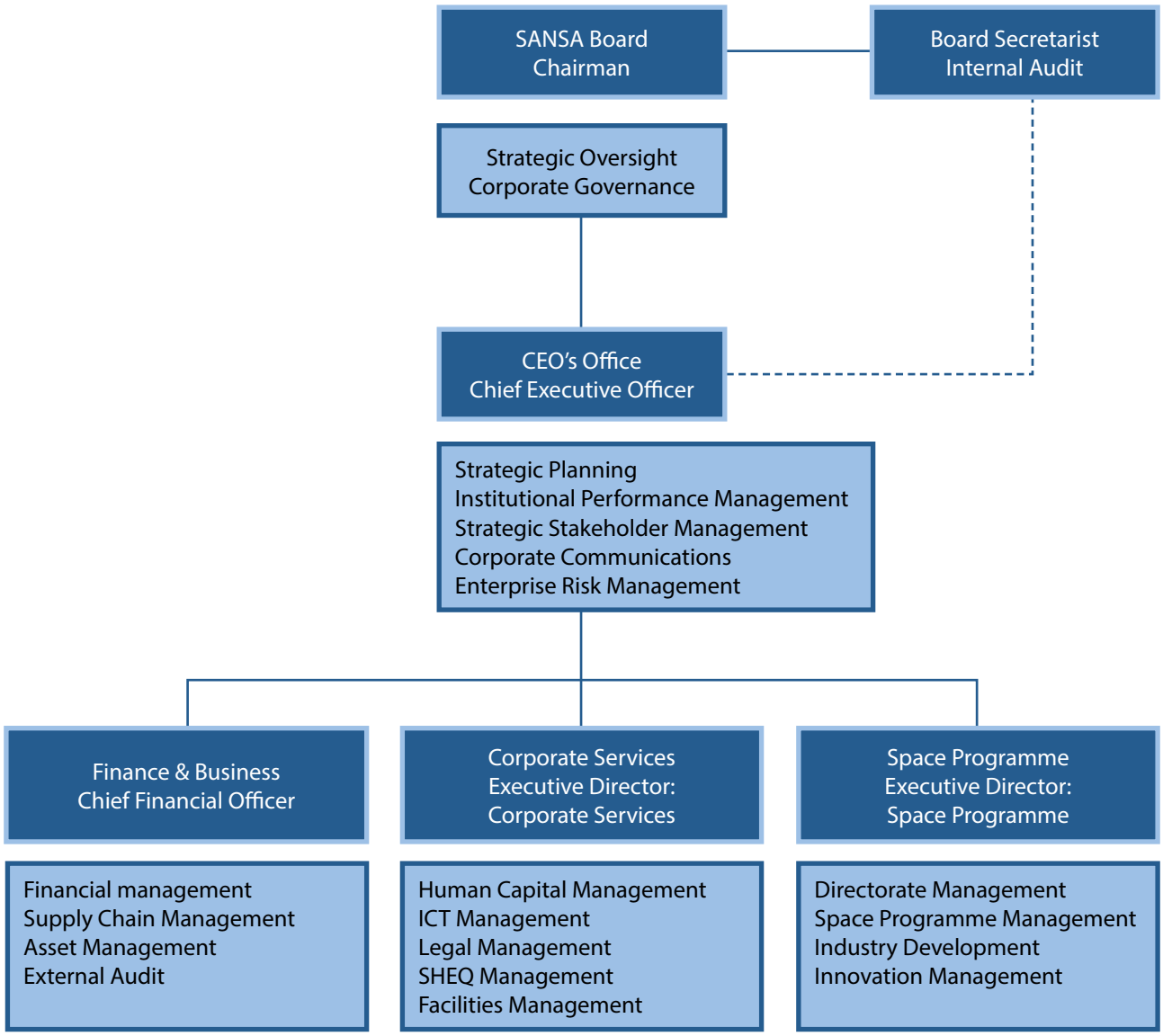
PART B: PROGRAMME PERFORMANCE PLANS

PROGRAMME 1: ADMINISTRATION PROGRAMME (AP)

Purpose

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

Programme Structure



Strategic Focus

Goal 1: Ensure the growth and sustainability of SANSA

- Long-term space programme studies and planning
- Space programme coordination

Goal 6: Ensure the growth and sustainability of SANSA

- Effective strategic planning, implementation and performance management
- Strategic relevance and impact
- Driving new business development
- Ensuring financial sustainability
- Marketing and communication
- Efficient financial management and strategic procurement

Goal 7: Transform SANSA into a high performance Agency

- High-level talent management
- Operation efficiency and delivery
- Good corporate governance

Strategic Goal 6: Ensure the growth and sustainability of SANSA

To ensure the Agency's mandate is efficiently and effectively executed, a strong focus on new business development, effective engagement with key stakeholders, and the impactful communication and promotion of SANSA's activities, are necessary. Such initiatives will help foster favourable support for the SANSA brand as well as increase the Agency's brand value. The initiatives will also contribute positively towards the revenue growth of the Agency. The growth of SANSA is reliant on the adoption and resourcing of the National Space Programme, a framework that articulates the national space agenda for the country up until 2030. Throughout the growth phase, SANSA will lead and coordinate national space activities to ensure minimal duplication of efforts and the seamless integration of such activities.

Annual Priorities

Financial Sustainability

Implement the financial sustainability strategy and framework with a key focus on:

a. Revenue enhancement strategies through new business development initiatives

b. Cost recovery mechanism for value added services provided, and

c. Asset infrastructure investment and monitoring to ensure continued provision of value added services

The monitoring of National Space Programme Activities

The monitoring of the implementation of the NSP will be done at a high-level and more qualitatively using a dashboard system that evaluates the status on the NSP projects as outlined in the table below. It is recognised that not all the projects will be initiated at once and so the monitoring will be at the level of assessing if there is ongoing activity in each of the projects. This effort will also strengthen the programme coordination efforts of SANSA.

The SANSA Programmes will prioritise the projects identified in the table below.

NSP Core Administration and Governance (NSP CAG)	National Earth Observation Programme (NEOP)	National Space Science Programme (NSSP)	National Space Engineering Programme (NSEP)	National Space Operations Programme (NSOP)
P1: Space Coordination and Industrial Development	P1: Earth Observation Data Centre (EODC) at SANSA	P1: Magnetic Anomaly Investigations	P1: Technology and Mission Development	P1: TT & C
P2: Space Programme Management	P2: Remote Sensing and Data Management Competence Development	P2: Status of the Space Environment	P2: Nano and Pico-satellites	P2: Mission Control
P3: Infrastructure and Facilities Management	P3: Applications Development and Deployment	P3: Space Science in Remote Areas	P3: Mini Satellites	P3: Navigation
P4: Human Capacity Development	P4: EO for Earth System and Global Change Research	P4: Hazard Mitigation and Disaster Management	P4: Micro Satellites	P4: Communications
P5: Science Advancement and Space Awareness	P5: Human Capacity Development (HCD)	P5: Applied Electromagnetic Technology	P5: Industrial Development and Commercial Opportunities	P5: Infrastructure and Facilities
P6: International Partnerships	P6: Cyber Infrastructure	P6: Infrastructure and Facilities	P6: Infrastructure and Facilities	P6: Invest and grow Teleport hosting abilities
	P7: Science Advancement	P7: Human Capacity Development	P7: Human Capacity Development	
	P8: User needs and future vision initiatives	P8: Science Advancement	P8: Science Advancement	
	P9: African Resource and Environment Management Satellite Constellation (ARMC)			

Table 7: NSP Dashboard

Strategic Goal 7: Transform SANSA into a high performance Agency

The achievements of the SANSA objectives require a high performance organisation that is characterised by transformational leadership, sound human capital management, robust business design, and operational and technological efficiency and effectiveness.

To ensure that SANSA is optimised for high performance, the following will be undertaken:

- Embedding a high performance culture driven by sound leadership, client / customer focus, stakeholder management and partnering, best practice business processes, and "living" the organisational values.
- Implementing a new performance management and development system;
- Optimising SANSA's information and business systems to support operations, innovation and managerial processes through a new ERP system;
- Ensuring transformation particularly by addressing gender imbalances in the SET sectors of SANSA;

- Increasing the absorption of the youth into key activities of SANSA;
- Reviewing the organisational design to ensure that the structure reflects the organisation's strategic focus.

Coordination of the Space Programme

One of the primary mandates of SANSA is to lead and coordinate the national space sector and ensure that various space activities are better integrated and optimised. SANSA has to minimise duplication of efforts and ensure a cost effective national space programme that remains responsive to the needs of the country.

Long-term Planning and Evaluation of the Space Programme

One of the areas where SANSA has been lacking is in conducting long-term studies and evaluations of the national space programme to inform the long-term government strategic and investment choices of government. SANSA will establish this in-house function and competence: In particular the following studies/reports will be produced:

a. The Size and Health of the South African Space Sector and Proposed Growth, and

b. The progress status of the NSP and Recommendations

Programme Performance Outputs 2017/18

ADMINISTRATION PROGRAMME

Administration Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 1: Address South Africa's challenges through space services and products	S1.2 Provide government with effective policy or decision tools and support	M1.2 The number of government decision or policy support tools	A report on "The Size and Health of the South African Space Sector and Proposed Growth"	Formulate questionnaire and send it out; collect necessary data & information through all means	Analyse collected information & collect supplementary or clarification information where necessary.	Write report & present first draft to Senior Management	Final Report approved by Senior Management & submitted to the Board.
Goal 6: Ensure the growth and sustainability of SANSA	S6.1. Ensure that SANSA has annual measurable growth and is sustainable	M6.1 Total non-ring-fenced SANSA revenue	R251 million	R62 million	R63 million	R63 million	R63 million

Administration Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 6: Ensure the growth and sustainability of SANSA		M6.2 Estimated monetised impact from space related activities	Analysis and interpretation of key data. Develop complete analytical model on quantification of space value. The Model will allow for dynamic changes to the industry. Finalise report on the monetised impact of space related activities.	Formulate and collect data on the following contributors: • The percentage of Launches and the industry value worldwide • Commercial partners in South Africa (e.g. SCS and Denel) – Value and growth to Space industry • The value on training and development of Students through the HCD programme • Value of Earth observation data to Government. Value created from scientific research to broader industry	Analysis, interpretation of data on the following contributors: • The percentage of launches and the industry value worldwide • Commercial partners in South Africa (e.g. SCS and Denel) – Value and growth to Space industry • The value on training and development of students through the HCD programme • Value of Earth observation data to Government. Value created from scientific research to broader industry	Write and Develop complete analytical model on quantification of space value. The Model will allow for dynamic changes to the industry.	Finalise and present the report on the monetised impact of space related activities.
		M6.3 SANSA's public value awareness	70%	Develop communication plan support to Stakeholder plan for the FY	50% progress on communication plan	75% progress on communication plan	Survey to measure improvement in stakeholder awareness to 70% awareness

Administration Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 6: Ensure the growth and sustainability of SANSA	S6.2. Ensure the effective implementation of the NSP	M6.4. High-level NSP implementation progress status.	50%	25% progress on Annual Target of 50%	50% progress on Annual Target of 50%7	75% progress on Annual Target of 50%	100% progress on Annual Target of 50%

Administration Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 7: Transform SANSA into a high performance Agency	S7.1. Ensure that SANSA has been optimised for high performance	M7.1Implementation of identified initiatives that enhance organisational performance	Coordination and quarterly reporting on the activities of the national space programme	Coordination of the national space programme Assessment of activities NEOP component of the NSP and present report to the Board	Coordination of the national space programme Assessment of activities NSSP component of the NSP and present report to the Board	Coordination of the national space programme Assessment of activities NSOP component of the NSP and present report to the Board	Coordination of the national space programme Assessment of activities NSEP component of the NSP and present report to the Board
			Long term capital maintenance and investment framework and implementation plan (Progressive Quantitative Target)	Develop the capital investment and maintenance framework	Calculation of baseline capital investment and maintenance history and a calculation of required capital investment and maintenance plan	Prioritisation of key capital investments and maintenance requirements	Long-term budget requirements concluded for capital investments and maintenance requirements
			Develop and implement new Performance Management System (PMS)	Development of new PMS design	Change management & communication plan for implementation of new PMS	Tools for performance measurement / evaluation developed	New PMS implemented

Administration Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 7: Transform SANSA into a high performance Agency			Complete implementation of new ERP system	Development of new ERP system design	Change management & communication plan for new ERP system	Finance / HR and other modules within scope implemented	New ERP system implementation completed
		M7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	PDI employees (D-F grades): 16	16	16	16	16
			Total employees (D-F grades): 20	20	20	20	20
			Proportion: 80%	80%	80%	80%	80%
		M.7.3 Proportional (%) of investment into staff training & development against operating expenditure	Training &Development Expenditure: R400 000	R100 000	R100 000	R100 000	R100 000
			Total Operating Expenditure: R40 million	R10 million	R10 million	R10 million	R10 million
			Proportion: 1%	0.25%	0.25%	0.25%	0.25&

Resource Considerations

Administration Programme Expenditure

Administration Programme	Audited Outcome			Revised budget	Medium Term Expenditure Framework			Total MTEF
Rand thousand	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Total Revenue	**37 137**	**49 446**	**38 802**	**39 002**	**40 525**	**41 840**	**44 795**	**127 160**
Current payments								
Compensation of employees	23 627	21 800	23 968	25 645	29 944	32 160	34 540	96 644
Goods and services	11 709	16 169	11 517	9 866	9 326	9 578	10 147	29 051
Payments for capital assets	1 801	11 477	3 317	3 491	1 256	102	108	1 466
Total Expenditure	**37 137**	**49 446**	**38 802**	**39 002**	**40 525**	**41 840**	**44 795**	**127 160**

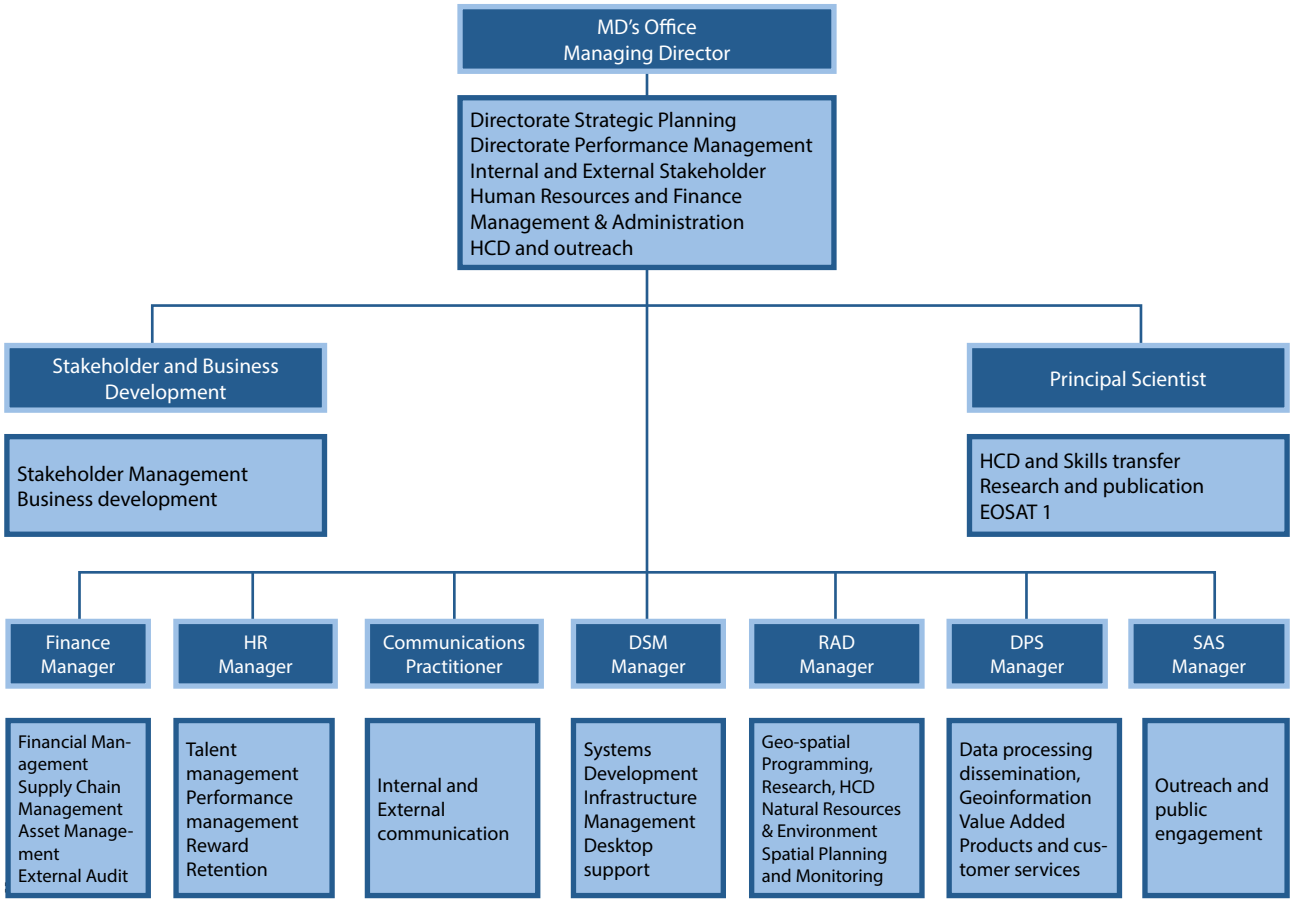
The Administration Programme is allocated R127 million over the medium term, with annual allocation of R40 million in 2017/18, R41 million in 2018/19 and R45 million in 2019/20. The spending is mainly governance and administrative support to all core programmes, as well as driving strategic goals 6 and 7 to ensure the growth and sustainability of SANSA and to transform SANSA into a high performance institution.

PROGRAMME 2: EARTH OBSERVATION PROGRAMME (EOP)

Purpose

The Earth Observations Programme is responsible for the collection, processing, archiving and distribution of Earth observation data, value-added data products and services 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 supports human capital development in Earth observation and science advancement.

Programme Structure



Strategic Focus

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

- National geospatial decision support data products including the Earth Observation Data Centre (EODC)
- National land use, land cover base maps (National Human Settlement Map; National Water Map; National Vegetation Map; National Disaster Management Map)
- Marine Information Services (Operations Phakisa)

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

- Remote sensing research
- Data management and algorithm R&D

Goal 3: Develop national human capacity and ensure transformation

- Science outreach and awareness
- Student and intern training
- Student funding
- Fundisa resources
- University suppor

Goal 5: Develop active global partnerships

- Development and servicing of national and international partnerships
- Joint projects with external partners

Goal 7: Transform SANSA into a high performance Agency

- Ensuring equity and transformation
- High-level institutional performance

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

1. Operation Phakisa (Marine Information Services)

As part of the NDP, the country has embarked on Operation Phakisa. The initiative seeks to leverage R177 billion from ocean activities by 2033. SANSA will contribute to the establishment and operationalisation of the national ocean and coastal information system and will enhance the country's maritime Earth observation monitoring capability through the utilisation of optical and radar imagery. Earth Observation based information will play an integral role in ocean protection through ship surveillance, water pollution detection and monitoring of fishing activities. SANSA will avail its sensor portfolio and research capability to support maritime spatial planning and coastal infrastructure mapping. The agency will also extend its Earth observation capability to support the national ocean and coastal water-monitoring programme.

2. National Geospatial Decision Support Data and information

SANSA will respond to the user needs with high quality image data products and services. SANSA acquires satellite data from a number of international satellite vendors for national use. These include Landsat 7 and 8, SPOT 6 and 7, MODIS and CBERS-4. This centralised acquisition under a single-license multi-user arrangement eradicates costly and multiple acquisition of the same datasets by the public sector, ensures the long-term archiving of the valuable data stock, and results in a saving of over 80% on the commercial list prices for the collective public sector. An estimated 40 government entities, on both the national and provincial level, use these data resources. SANSA has also negotiated favourable licensing to allow for discounted access to this data to the South African private sector and the Southern African Development Community (SADC) region. SANSA seeks to:

- increase the ease of access to the national geospatial decision support data products and services;
- develop new processing tools so as to enhance the user experience and benefit;
- improve the quality of the data products and services; and
- improve its turnaround times.

3. National Land Use Land Cover Base Maps

SANSA will further process some of the satellite imagery to provide base information products for national use. SANSA has identified four key national land use and land cover maps.

a. **National Human Settlement Maps:** This will focus on mapping all built up areas using automated algorithms. The results of the human settlements maps will be distributed to the Department of Human Settlements, Housing Development Agency, Statistics South Africa, Municipal Demarcation Board, Eskom, Department of Environmental Affairs, municipalities, Department of Agriculture, Forestry and Fisheries and the Department of Water Affairs and Sanitation. The digital human settlements maps will also be posted on the web to allow users to interactively query the geo-database and extract attributes of interest from these maps.

b. **National Water Maps:** The focus will be on supporting the Department of Water Affairs and Sanitation, Department of Environmental Affairs and the Department of Agriculture, Forestry and Fisheries with water information products. Priority will be given to the automated extraction of water bodies using small available sensors. Water body maps will incorporate an inventory of all water bodies including dams, in the country to ensure compliance with the Water Act and for water licencing purposes. Additional work will also be undertaken to support water quality assessment, water demand modelling and land degradation assessment at water catchment levels. Work on this project will be undertaken in line with the European Space Agency (ESA) funded TIGER programme.

c. **National Vegetation Maps:** The focus is on automating the generation of vegetation indices at a national scale using Landsat 8 data. The vegetation-mapping project will also encompass the mapping of rangelands in South Africa, which will be undertaken within the Group on Earth Observations Global Agricultural Monitoring Initiative: Rangelands and Pasture Productivity initiative (GEOGLAMRAPP) framework. The users of vegetation products will include the Department of Agriculture, Forestry and Fisheries for rangeland assessment together with Department of Water Affairs and Sanitation and the Department of Environmental Affairs. SPOT 6 & 7 and CBERS 4 data will also be integrated into this project.

d. **National Disaster Management Map:** In conjunction with the National Disaster Management Centre, the focus will be on flood prediction and vulnerability modelling, development of flood and fire maps, drought monitoring and the generation of reference datasets for disaster management. SANSA will support various disaster management authorities at provincial level. Collaborations with NASA and ESA will be strengthened in order to reach this goal.

4. Decision and Policy Support Tools

The Earth Observation Programme will develop a policy brief on "Understanding Food Security using Earth observation technology." The 2015-16 droughts in South Africa coupled with changes in the climate have affected agriculture and food security. There are already increases in food prices that are aggravating food insecurity especially among the rural communities that directly depend on land resources. Agriculture and food security challenges do not manifest in isolation, but is aligned to human population growth and the availability of adequate and quality-water resources. SANSA will incorporate products from the human settlement and water body layers previously completed in the development of the policy brief on "The use of EO in the understanding of agriculture and food security in South Africa". This work will be an extension of the partnership between SANSA and Airbus on Crop Watch 4 SA, and will work in partnerships with Department of Agriculture, Forestry and Fisheries, Grain SA, AgriForum, the Department of Rural Development and Land Reform (DRDLR), National Agricultural and other relevant national institutions.

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

SANSA will conduct remote sensing research that seeks to strengthen the delivery of the key outputs in Goal 1 and thus contribute to key national research priorities in collaboration with universities and international partners. Two priority research areas are (i) Remote Sensing and Malaria in Southern Africa and (ii) Monitoring and Mapping invasive species under current environmental change conditions. The research will focus on improving the data management and processing routines with a view to increasing the extraction of information from the data, the archiving and distribution of data.

Strategic Goal 3: Develop national human capacity and ensure transformation

Science advancement will focus more on the Northern provinces working together with the Space Operations Programme. Student training with be pursued through targeted funding, the provision of the Fundisa disc to universities, enhancing the Fundisa student portal, and supporting universities with satellite data.

Strategic Goal 5: Develop active global partnerships

National partnerships with government departments and other public entities will be strengthened to ensure that space is integrated into national service delivery. Global partnerships under CEOS, GEO, and AfriGEOSS will also be enhanced to increase SANSA's footprint in the global space arena.

Strategic Goal 7: Transform SANSA into a high performance Agency

SANSA will pursue a transformation agenda in terms of staff and students. This will include staff development initiatives, improved stakeholder engagement, financial sustainability, talent management, and business systems improvements.

Programme Performance Outputs

EARTH OBSERVATION PROGRAMME

Earth Observation Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 1: Address South Africa's challenges through space services and products	S1.1 Lead and facilitate the creation of high-impact products and services to address society's needs and challenges	M1.1 The number of national high-impact products and services	1. Operation PHAKISA: Contribute to the implementation of the National ocean and coastal information system and extending Earth observation capacity	Stakeholder engagement Report	50% of data acquisition plan towards implementation of the research plan for coastal and marine monitoring	80% of data acquisition plan towards implementation of the research plan for coastal and marine monitoring	100% of data acquisition plan towards implementation of the research plan for coastal and marine monitoring
			2. National geospatial decision support data products	Develop an image processing implementation plan for SPOT and, Landsat	1 National Mosaic	-	1 National Mosaic
			3. National land-use and land-cover base maps (information products)	Develop and implement a land cover classification plan, for vegetation indices	50 % vegetation indices national maps	80 % vegetation indices national maps	100% vegetation indices national maps
	S1.2 Provide government with effective policy or decision tools and support	M1.2 The number of government decision or policy support tools	Policy brief on Earth Observation and Food Security	Develop and present a policy brief proposal	First draft for the policy brief	Second draft peer reviewed policy brief	Final draft & submission for approval

Earth Observation Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 2: Lead high-impact collaborative R&D on a national scale	S2.1 Increase the national space research output	M2.1 The national research productivity score for space supported R&D (This productivity score is based on a function of research funding sourced + publications (journals, books, reports, proceedings) + students graduated + research rating status)	300	No target for Q1- Research rating reported at the end of the first quarter of the academic/ calendar year	100	50	150
Goal 3: Develop national human capacity and ensure transformation	S3.1.Increase youth awareness of science	M3.1 The number of youth directly engaged through science awareness & outreach activities (This excludes arms-length engagement with the youth e.g. a visit to one of SANSA's exhibition stands)	4800	800	2000	3400	4800
	S3.2 Support students with a transformation agenda		PDI Target: 16	10	16	16	16
			Total Students: 20	15	20	20	20
			PDI Proportion: 80%	67%	80%	80%	80%
Goal 4: Enhance the competitiveness of the South African space industry	S4.2 Grow the national space industry	M4.2.3 The total contract expenditure to SMEs for core space projects	R1.2 million	0	R200 000	R500 000	R500 000

Earth Observation Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 5: Develop active global partnerships	S5.1. Leverage a significant benefit for the space programme through global partnerships	M5.1 The equivalent revenue generated through partnerships as a proportion of the EO non-commercial operating revenue	Stakeholder Income: R1.8 million	R450 000	R900 000	R1 350 000	R1 800 000
			Non-Commercial Revenue: R 60 million	R15 million	R30 million	R45 million	R60 million
			Proportion: 3%	3%	3%	3%	3%
Goal 7: Transform SANSA into a high performance Agency	S7.1. Ensure that SANSA has been optimised for high performance	M7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	PDI employees (D-F grades): 11	11	11	11	11
			Total employees (D-F grades): 13	13	13	13	13
			Proportion: 80%	80%	80%	80%	80%
		M.7.3 Proportional 1 (%) of investment into staff training & development against operating expenditure	T&D Expenditure: R371 000	R92 750	R92 750	R92 750	R92 750
			Total Operating expenditure (Excl. SPOT license fees): R37 086 000	R9.2 million	R9.2 million	R9.2 million	R9.2 million
			Proportion: 1%	0.25%	0.25%	0.25%	0.25%

Earth Observation Programme Resource Considerations

Earth Observation Programme Expenditure

Earth Observation Programme	Audited Outcome			Revised Budget	Medium Term Expenditure Framework			Total MTEF
Rand thousand	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Total Revenue	**56 357**	**97 495**	**69 601**	**72 164**	**76 514**	**80 309**	**84 185**	**241 008**
Current payments								
Compensation of employees	16 433	19 391	22 461	22 541	22 768	24 452	26 262	73 482
Goods and services	35 620	45 840	44 640	48 023	51 896	53 857	55 811	161 564
Payment for capital assets	4 304	32 265	2 500	1 600	1 850	2 000	2 112	5 962
Total Expenditure	**56 357**	**97 495**	**69 601**	**72 164**	**76 514**	**80 309**	**84 185**	**241 008**

The Earth Observation Programme has an allocation of R241 over the medium term. Annual allocations are at R76 million in 2017/18, R80 million in 2018/19 and R84 million in 2019/20. The major expenditure in this programme is mainly towards access to Earth observation satellites and the related maintenance for data processing and storage facilities for satellite imagery acquired over the years.

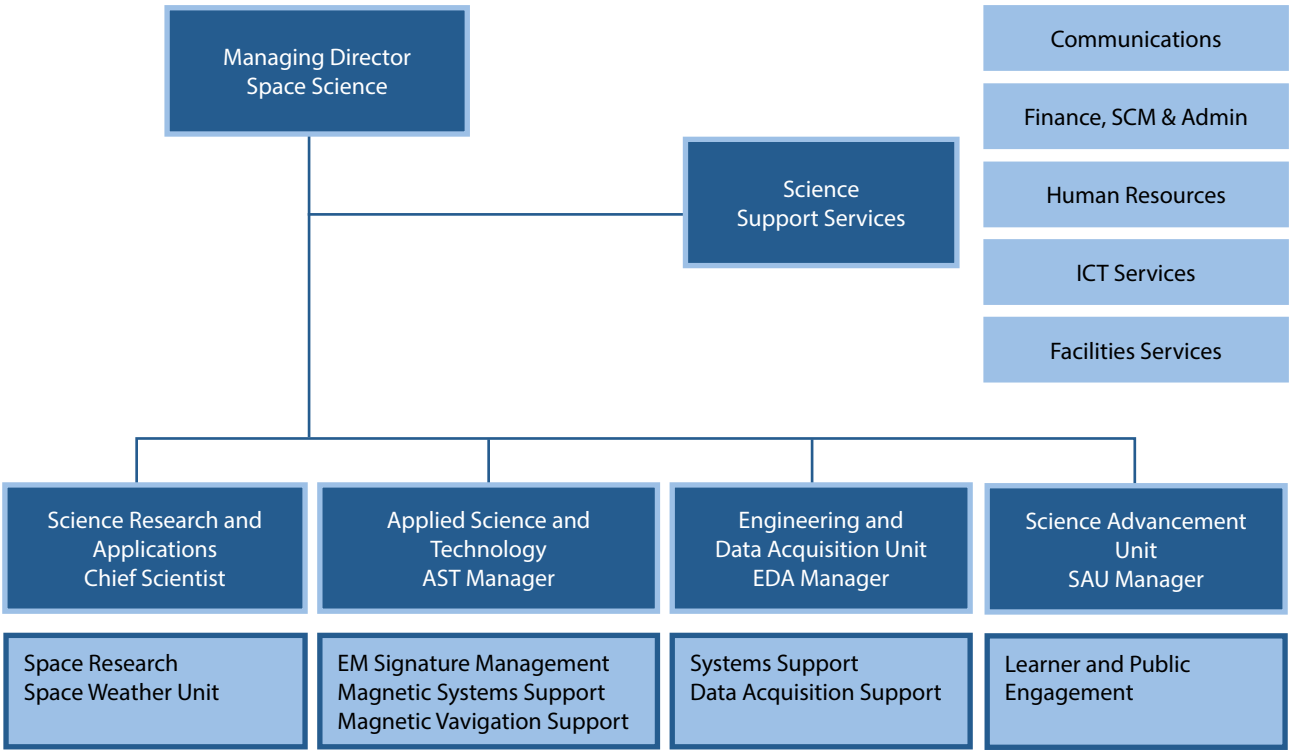
SANSA acquires satellite data and images at a cost of R43 million per annum in licence fees, from a number of international satellites for national use. An estimated 40 government entities, on both the national and provincial level, use these data resources. In addition to the licence fees, the cost of processing, archiving and dissemination of satellite imagery including the maintenance of the ICT infrastructure and ground support costs R57 million per annum, requiring a total of R224 million over the MTEF.

PROGRAMME 3: SPACE SCIENCE PROGRAMME (SSP)

Purpose

The Space Science Programme leads multi-disciplinary space science research and development. Key functions include, fundamental and applied space science research, the support of space-facilitated science through science data acquisition, coordination and management of scientific data ground segments, provision of space weather and other geo-space and magnetic technology products and services on a commercial and private basis to the defence, maritime, communications, aviation and energy sectors. The programme also provides leadership in post-graduate science and engineering student training as well as science advancement including both learner and educator science support.

Programme Structure



Strategic Focus

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

- Space weather services for satellite systems, electric power networks, satellite-based navigation, communication, defence, and aviation applications
- Geomagnetic services
- Magnetic technology services for defence, maritime and aviation sectors

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

- Space science research
- Geo-space observational network
- Data management and distribution

Goal 3: Develop national human capacity and ensure transformation

- Science outreach and awareness
- Student and intern training
- Student funding
- University support

Goal 5: Develop active global partnerships

- Development and servicing of national and international partnerships
- Joint projects with external partners

Goal 7: Transform SANSA into a high performance Agency

- Ensuring equity and transformation
- High-level institutional performance

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

1. Space Weather Services

Space weather is an important field of research, as severe solar storms can affect the technology society has become increasingly dependent on. Space Weather is a global phenomenon that has regional impact. SANSA aims to develop expertise in the impact areas that affect South Africa in order to enable decision-makers to take the necessary mitigation steps. The relevant technologies that are vulnerable to space weather are:

a. **Satellite systems:** Space weather events may affect the electronics, communication and navigation systems of a satellite. These events can also cause changes in the satellite orbit, and lead to interrupted telemetry. Satellites play a vital role in the communication and navigation sector as well as base systems such as in banking, medicine, and disaster and resource management. Therefore, the loss of a satellite system or its use (even for a short time) can result in significant economic losses impacting various sectors.

b. **Electric power networks:** Space weather changes may result in Geomagnetically Induced Currents (GICs) flowing in long distance pipelines such as those utilised in the national power grid and in some mining applications. GICs may result in the damage of costly transformers with significant economic loss to the country due to power outages.

c. **Satellite-based navigation:** Satellite-based navigation (e.g. GPS) range errors increase when there is a variation in the total electron content induced by a space weather event. This can impact, for example, on the aviation sector that is dependent on satellite based navigation as a primary tool for landing systems as well as other navigation applications.

d. **Satellite-based communication:** Radio signals propagating from satellites to the Earth through the ionosphere can be disrupted by space weather events. This in turn could cause interruptions to radio communication from satellites such as voice, video, weather, avionics and satellite provided internet data.

e. **HF-based communication:** The extent to which radio signals within the High Frequency (HF) band travelling through the ionosphere are refracted, attenuated and absorbed is dependent on the geomagnetic conditions in space, which in turn depends on space weather conditions. Adverse space weather may lead to the defence, aviation, and amateur radio sectors.

f. **Aviation:** Space weather impacts on aviation can include effects such as disruption in HF communications, satellite navigation system errors, and avionics reliability. In addition, space weather events can increase radiation levels on-board planes, particularly long-haul flights because they fly at higher altitudes. The aviation industry require space weather products that assist with flight planning, and the International Civil Aviation Organisation (ICAO) have recommended that by 2018 all flight plans include space weather information by law. SANSA aims to be ready to provide this service, and to assist the aviation sector in space weather preparedness.

SANSA operates the Space Weather Regional Warning Centre for Africa, which forms part of the International Space Environment Service (ISES). SANSA's Space Weather Centre provides an important service to the nation by monitoring the sun and its activity to provide information, early warnings and forecasts on space weather conditions. Space weather and related geospace products and services are required primarily for communication and navigation systems, in the defence, aeronautics, navigation and communication sectors. SANSA currently provides daily (working day) space weather updates and early warnings, and an on-call service for clients, as well as space weather training courses to improve utilisation of the provided information. The SANSA Space Weather Centre has a mobile SMS and email warning system to facilitate emergency warnings. Client focus web based services are provided to ensure that the different sectors receive the information in the most appropriate format for their usage. Priorities for 2017/18 include:

- further improvements to the space weather product and service portfolio;
- continued delivery of products and services to the defence and energy sector; and
- research into appropriate products and services for the aviation industry.

2. Magnetic Technology Services

SANSA operates a magnetically clean facility that includes a large three axis Helmholtz coil system and a Non-magnetic temperature chamber among other specialised magnetic technology related equipment. The facility provides an important service to the nation and clients in both the space and non-space sectors through the provision of electric and magnetic navigation ground support, magnetic field modelling, and other magnetic technology services, such as landing compass calibrations, and magnetic sensor sourcing and integration. SANSA's magnetic technology services are primarily provided to the defence, navigation and aviation sectors. Priorities for 2017/18 include:

- continued support to the defence, aviation and maritime sectors;
- an increased focus on magnetic sensor integration; and
- the provision of magnetic technology services to the national and international space community.

3. Decision and Policy Support Tools

SANSA will develop a policy brief on "Safety and Security applications from a Non-magnetically clean environment." Given the importance of a magnetically clean environment for the provision of a multitude of products and services provided for the defence sector, including magnetic navigation ground support, landing compass calibrations and magnetic sensor integration, it is important to qualify the dependence of the defence sector on this kind of facility and the expertise required to deliver defence related services. This policy brief will also provide an understanding to decision makers on the value proposition that SANSA's magnetically clean environment provides the nation, and the uniqueness of this facility on the African continent.

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

SANSA will conduct research and create new knowledge and a better understanding of the universe and the near-Earth space environment. SANSA operates a wide and multi-faceted geo-space observational network in the southern African region extending to Antarctica and the Atlantic Islands. This provides a geo-space laboratory for the country to conduct cutting-edge research on the near-Earth space environment, and to lead the quest for innovative solutions and new science. SANSA also provides research leadership for the nation through success in both national and international research proposals, and the ratings of its researchers.

Strategic Goal 3: Develop national human capacity and ensure transformation

SANSA science advancement will focus more on the southern provinces working together with other SANSA programmes that focus on the more northern parts of the country. The SANSA Science Centre and the Mobile Lab will form the primary instruments for learner and educator engagement. Student training will be pursued through targeted funding, assisted supervision, the provision of relevant space-related projects, university partnerships and collaboration with the National Astronomy and Space Science Programme (NASSP).

Strategic Goal 5: Develop active global partnerships

Global partnerships with ISES, INTERMAGNET, EISCAT, COSPAR, SCAR and various space agencies/entities will be strengthened, and stronger participation in international research proposals will be pursued. SANSA's strength as a gateway to Africa and Antarctica will be leveraged to ensure collaboration and participation in international projects for national researchers and engineers. The SANSA Optical Space Research Laboratory (OSR) and the SANSA Antarctic Programmes will be the main vehicles for this partnership.

Strategic Goal 7: Transform SANSA into a high performance Agency

The Programme will pursue a transformation agenda in terms of staff and students. The location of the Space Science facility in Hermanus does pose a challenge in attracting and retaining young scientists and engineers. However, an aggressive recruitment drive that includes the benefits of living in Hermanus and working for SANSA as well as a bottom-up approach to skills development is being pursued to overcome these challenges.

Programme Performance Outputs

SPACE SCIENCE PROGRAMME

Space Science Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 1: Address South Africa's challenges through space services and products	S1.1 Lead and facilitate the creation of high-impact products and services to address society's needs and challenges	M1.1 The number of national high-impact products and services	4. Space weather products and services HF Propagation Prediction Services Space Weather Bulletins & Alerts Space Weather Course Space Weather Support Tools	Provide daily space weather bulletins and HF predictions through subscription service and on website; Deliver all requested special predictions: Inform clients of adverse space weather as warnings through subscription service; Provide space weather support as requested; Deliver any requested space weather training courses	Provide daily space weather bulletins and HF predictions through subscription service and on website; Deliver all requested special predictions; Inform clients of adverse space weather as warnings through subscription service; Provide space weather support as requested; Deliver any requested space weather training courses	Provide daily space weather bulletins and HF predictions through subscription service and on website; Deliver all requested special predictions; Inform clients of adverse space weather as warnings through subscription service; Provide space weather support as requested; Deliver any requested space weather training courses	Provide daily space weather bulletins and HF predictions through subscription service and on website; Deliver all requested special predictions; Inform clients of adverse space weather as warnings through subscription service; Provide space weather support as requested. Produce user engagement and impact report

Space Science Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 1: Address South Africa's challenges through space services and products			5. Magnetic Technology products and services Compass Calibrations Magnetic Navigation Ground Support Services Magnetic Field Model Maps Magnetic Sensor Sourcing Aircraft Swing Courses	Calibrate at least 25 compasses for private and defence clients Provide all requested magnetic navigation ground support consultation, magnetic field variation, aircraft swing courses & magnetic sensor services. Deliver any magnetic technology related courses or training assistance required.	Calibrate at least 25 compasses for private and defence clients Provide all requested magnetic navigation ground support consultation, magnetic field variation, aircraft swing courses & magnetic sensor services. Deliver any magnetic technology related courses or training assistance required.	Calibrate at least 25 compasses for private and defence clients Provide all requested magnetic navigation ground support consultation, magnetic field variation, aircraft swing courses & magnetic sensor services. Deliver any magnetic technology related courses or training assistance required.	Calibrate at least 25 compasses for private and defence clients Provide all requested magnetic navigation ground support consultation, magnetic field variation, aircraft swing courses & magnetic sensor services. Deliver any magnetic technology related courses or training assistance required. Produce user engagement and impact report.
	S1.2 Provide government with effective policy or decision tools and support	M1.2 The number of government decision or policy support tools	A policy advisory brief covering the safety and security applications from a magnetically clean environment	Develop the concept & identify the key impact areas to be covered	Design a framework document from which a policy brief will be drafted	Draft the policy brief	Refine the document & submit for approval

Space Science Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 2: Lead high-impact collaborative R&D on a national scale	S2.1 Increase the national space research output	M2.1 The national research productivity score for space supported R&D (This productivity score is based on a function of research funding sourced + publications (journals, books, reports, proceedings) + students graduated + research rating status)	1200	400	240	160	400

Space Science Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 3: Develop national human capacity and ensure transformation	S3.1. Increase youth awareness of science	M3.1 The number of youth directly engaged through science awareness & outreach activities (This excludes arms-length engagement with the youth e.g. a visit to one of SANSA's exhibition stands)	4800	1200	2000	1400	200

Space Science Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 3: Develop national human capacity and ensure transformation	S3.2 Support students with a transformation agenda	M3.2 The proportion of supported PDI students for formalised training (This excludes short courses and focuses on students that are registered for some formal training for a degree, diploma, or certificate within the South African National Qualification Framework)	PDI Target: 28	24	28	28	28
			Total Students: 35	30	35	35	35
			PDI Proportion: 80%	80%	80%	80%	80%
Goal 5: Develop active global partnerships	S5.1. Leverage a significant benefit for the space programme through global partnerships	M5.1 The equivalent revenue generated through partnerships as a proportion of the Space Science non-commercial operating revenue	Stakeholder Income: R840 000	R210 000	R420 000	R630 000	R840 000
			Non-Commercial Rev: R 28 million	R7 million	R14 million	R21 million	R28 million
			Proportion: 3%	3%	3%	3%	3%

Space Science Programme				Quarterly Targets			
Strategic Goal	Strategic Objective	Key Performance Indicator/ Measure	Annual Target	Q1	Q2	Q3	Q4
Goal 7: Transform SANSA into a high performance Agency	S7.2. Ensure that SANSA has been optimised for high performance	M7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	PDI employees (D-F grades): 15	15	15	15	15
			Total employees (D-F grades): 25	25	25	25	25
			Proportion: 60%	60%	60%	60%	60%
		M.7.3 1% of investment into staff training & development against operating expenditure	T&D Expenditure: R358 470	R89 617	R89 617	R89 617	R89 617
			Total Operating Expenditure: R35 million	R8.9 million	R8.9 million	R8.9 million	R8.9 million
			Proportion: 1%	0.25%	0.25%	0.25%	0.25%

Space Science Programme Resource Considerations

Space Science Programme	Audited Outcome			Revised budget	Medium Term Expenditure Framework			Total MTEF
Rand thousand	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2018/19	
Total Revenue	**39 122**	**36 291**	**33 779**	**35 125**	**35 059**	**36 661**	**37 599**	**109 319**
Current payments								
Compensation of employees	19 870	21 205	21 262	23 696	26 719	28 696	30 262	85 677
Goods and services	17 881	13 086	10 295	9 483	7 419	6 990	6 307	20 716
Payment for capital assets	1 371	2 000	2 222	1 946	922	975	1 030	2 926
Total Expenditure	**39 122**	**36 291**	**33 779**	**35 125**	**35 059**	**36 661**	**37 599**	**109 319**

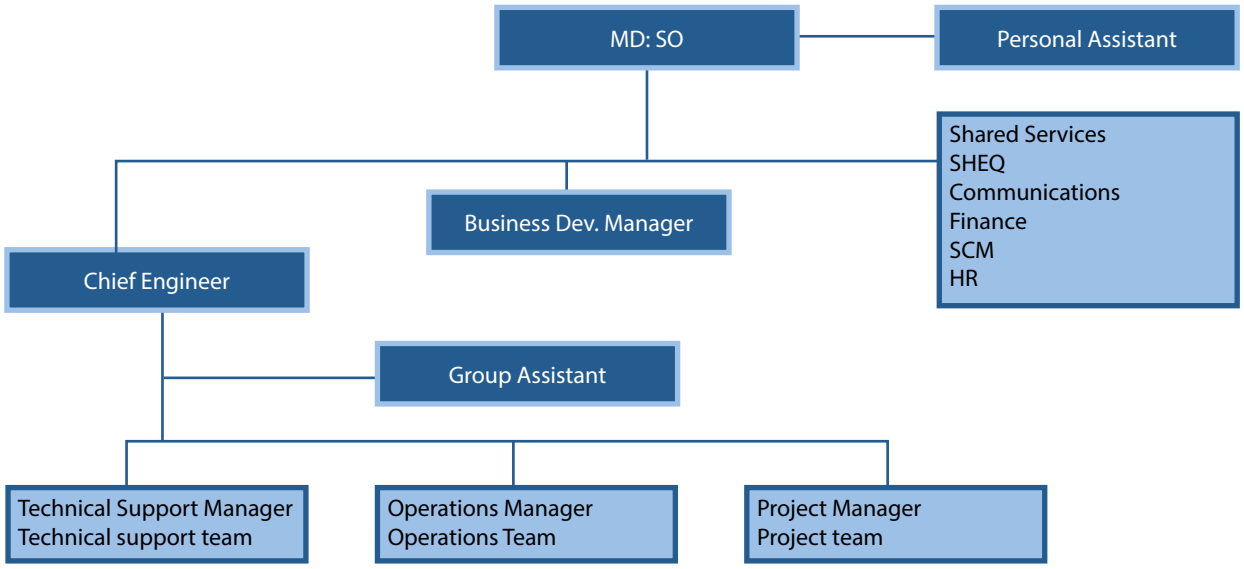
The SANSA Space Science programme has an allocation of R109 million over the medium term, with annual allocations of R35 million in 2017/18, R36 million in 2018/19 and R38 million in 2019/20. The major expense allocation is in employee costs attributed to scientists and engineers focused on fundamental and applied space science research, the management of scientific data ground segments, and the provision of space weather and other geo-space products and services.

PROGRAMME 4: SPACE OPERATIONS PROGRAMME (SOP)

Purpose

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 both national and international space industry clients and governments. The programme also supplies hosting capabilities with the intention of expanding this capability to Teleports.

Programme Structure



Space Operations organogram

Mission Control	Support of all EO satellite sensors
	SA satellite mission control
Space Operation Services	Satellite launch support
	Transfer Orbit support
	In Orbit testing
	Life & emergency support
	Hosted infrastructure
	Carrier Monitoring
Space Applications	Navigation
	Space base Augmentation

Strategic Focus

Goal 4: Enhance the competitiveness of the South African space industry

- Data acquisition for the Earth Observation Programme
- Space operations support for various global launch activities
- Satellite in-orbit-testing
- Carrier monitoring
- Hosting of space operations infrastructure
- Satellite-based navigation
- Teleport hosting

Goal 3: Develop national human capacity and ensure transformation

- Science outreach and awareness
- Intern training

Goal 7: Transform SANSA into a high performance Agency

- Ensuring equity and transformation
- High-level institutional performance

Strategic Goal 3: Develop national human capacity and ensure transformation

SANSA science advancement will focus more on the Northern provinces working together with the Earth Observation Programme. Skills development will largely be in the form of internships, apprentices and technical qualifications, thus creating a career path for potential trainees.

Strategic Goal 4: Enhance the competitiveness of the South African space industry

Earth Observation Support

A large proportion (100%) of SANSA's space operations activities with respect to daily passes of Low Earth Orbit (LEO) satellites are devoted to data acquisition for SANSA's Earth Observation Programme. A total of 4500satellite passes is forecast for the year for Earth observation with a targeted success pass acquisition of 98%. The intention is to automate the process in the future. This would lead the organisation to be more efficient and enabling it to maintain the current success rate.

Income Generation

SANSA's space operations activities generate large foreign revenues with some local income from Earth observation data acquisition and defence related work. The total value of the programmes activities is related to its self-funding ability. Therefore, the level of income generated is important. The targeted revenue to be generated for 2017/18 is R44 million, a decrease of R16 million from the 2016/17 baseline of R60 million. The lower estimate related to a conservative approach to non-fixed income in the light of a volatile launch market.

Strategic Goal 7: Transform SANSA into a high performance Agency

The Programme will pursue a transformation agenda in terms of staff and students. The use of the internship programme and creating a clear career progression pathway will be key in enhancing equity in the technical areas.

Programme Performance Outputs

SPACE OPERATIONS PROGRAMME

Space Operations Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 3: Develop national human capacity and ensure transformation	S3.1. Increase youth awareness of science	M3.1 The number of youth directly engaged through science awareness & outreach activities (This excludes arms-length engagement with the youth e.g. a visit to one of SANSA's exhibition stands)	2400	800	800	400	400
	S3.2 Support students with a transformation agenda	M3.2 The number of supported PDI students for formalised training (This excludes short courses and focuses on students that are registered for some formal training for a degree, diploma, a or certificate within the South African National Qualification Framework)	PDI Target: 8	6	8	8	No student counting in Q4 to avoid a double count.
			Total Students: 10	8	10	10	
			PDI Proportion: 80%	75%	80%	80%	

Space Operations Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 4: Enhance the competitiveness of the South African space industry	S4.1. Generate greater benefit for the space programme through space operations activities	M4.1.1: Successful satellite pass monitoring rate for Earth Observation	Target Passes: 4412	1103	2206	3309	4412
			Total/Actual Requested Passes: 4500	1125	2250	3375	4500
			Proportion: 98%	98%	98%	98%	98%
		M4.1.2: Total commercial income generated per year from space operations activities.	R44 million	R11 million	R11 million	R11 million	R11 million
		M4.1.3: The proportion of space operations commercial income invested in other SANSA programmes (footnote in the consolidated page)	Investment: R2.2 million	R550 000	R550 000	R550 000	R550 000
			Commercial International Income: R44 million	R11 million	R11 million	R11 million	R11 million
			Proportion: 5%	5%	5%	5%	5%

Space Operations Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 7: Transform SANSA into a high performance Agency	S7.2. Ensure that SANSA has been optimised for high performance	M7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	PDI employees (D-F grades): 8	8	8	8	8
			Total employees (D-F grades): 13	13	13	13	13
			Proportion: 60%	60%	60%	60%	60%
		M.7.3 I 1% of investment into staff training & development against operating expenditure.	Training and Development Expenditure: R440 840	R110 210	R110 210	R110 210	R110 210
			Total Operating Expenditure : R44 million	R11 million	R11 million	R11 million	R11 million
			Proportion: 1%	0.25%	0.25%	0.25%	0.25%

Space Operations Programme Resource Considerations

Space Operations Programme Expenditure

Rand thousand	Audited Outcome 2013/14	2014/15	2015/16	Revised budget 2016/17	Medium Term Expenditure Framework 2017/18	2018/19	2019/20	Total MTEF
Total Revenue	**86 084**	**74 308**	**47 442**	**47 022**	**48 285**	**52 008**	**55 503**	**155 795**
Current payments								
Compensation of employees	22 255	25 128	26 435	28 575	31 993	34 360	36 903	**103 256**
Goods and services	40 693	17 548	17 007	12 222	12 292	13 648	14 376	**40 316**
Payment for capital assets	23 136	31 632	4 000	6 225	4 000	4 000	4 224	**12 224**
Total Expenditure	**86 084**	**74 308**	**47 442**	**47 022**	**48 285**	**52 008**	**55 503**	**155 796**

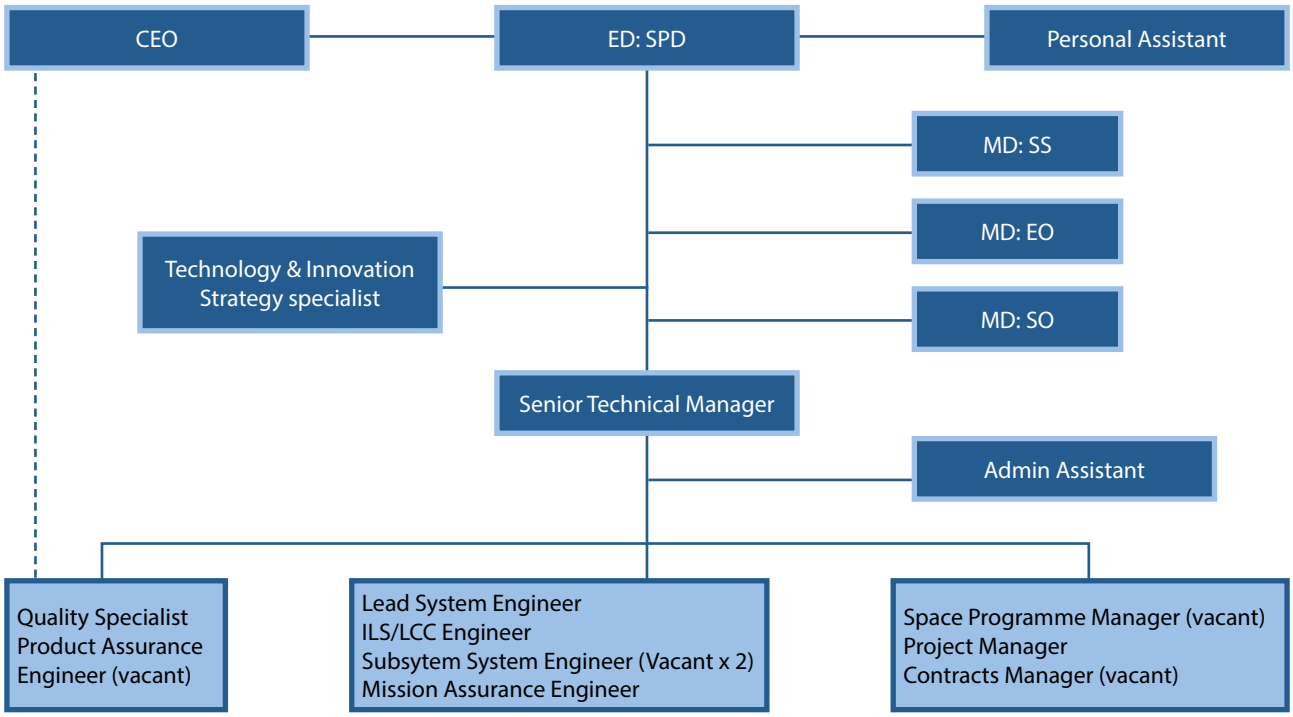
The budget for the medium term is externally sourced at R156 million, with annual revenue generation of R48 million in 2017/18 and R52 million in 2018/19 and R55 million in 2019/20. In order to maintain the investments in the antenna infrastructure and related operating systems, international client's infrastructure is hosted to generate income for the operations. Current estimates for the medium term indicate that most of the fixed term hosting contracts from international clients are reaching the end of term. The launch support revenue is excluded from the estimates, as it is difficult to estimate the probability of the launches happening, as well as the success of the launches. With the available budget, expenditure is largely on man-hours for the maintenance support and operations staff, as well as the ICT infrastructure and communication networks, and repairs and maintenance for ground infrastructure equipment.

PROGRAMME 5: SPACE ENGINEERING PROGRAMME (SEP)

Purpose

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

Programme Structure



Strategic Focus

Goal 3: Develop national human capacity and ensure transformation

- Student and intern training
- Student funding

Goal 4: Enhance the competitiveness of the South African space industry

- EO-Sat1 development
- Industry development
- Innovation management
- Facilities development
- Space programme management

Goal 7: Transform SANSA into a high performance Agency

- Ensuring equity and transformation
- High-level institutional performance

Strategic Goal 3: Develop national human capacity and ensure transformation

South Africa has a shortage of skilled personnel in the space engineering arena particularly from amongst previously disadvantaged individuals. Through the bursary programme and internship programme, SANSA aims to address this by strategically using the satellite build programme as an attractor.

Strategic Goal 4: Enhance the competitiveness of the South African space industry

Jobs Supported

SANSA and Denel Dynamics have a core compliment of employees that are directly involved with the Satellite Development Programme. A total 55 such employees is forecast for the year depending on the progress of the project. The relevant resources are highly dependent on the supporting contracts for the upgrade to the Houwteq facility.

EO-Sat1 Development

Preparation for preliminary design reviews will take place during the year and the predesign work on the technical requirements will be completed. Major components will undergo critical design review in preparation for the structural thermal design model. The qualification model will be manufactured and integrated for environmental testing culminating in the qualification of the spacecraft. The system definition activities are to be concluded with the product trees developed for the segments, so as to enable the finalisation of the acquisition plan and the procurement plans for the segments. The Ground Segment Architectural Design activities are to be concluded and the contracting baselines established by the Integrated Project Team. Work packages for both the mission control and data acquisition will be activated for final engineering implementation. The AIT facility will be upgraded to meet the minimum requirements for testing of EO-Sat1.

Assembly Integration and Testing Facility (AIT)

SANSA will develop various business cases and operating models for the use of Houwteq as an AIT facility. The facilities will provide support to both the South African space industry and potential international markets. The facility should cater for the South African Space, Automotive, and Defence industries, with a business model that is designed to incentivise the growth of those industries. An added benefit is that SANSA will develop closer relationships with the various stakeholders, and be able to determine the market needs and aspirations. The AIT facility will provide a neutral ground to stimulate a competitive market for space and related technologies. The model will encourage international customers to use the facility, which in turn will stimulate the local economy. The initial development cost would largely be dependent on government funding and, through the development of strategic partnerships, become sustainable over the long term.

Contracting value to private SME space industry

SANSA's mandate as prescribed in the SANSA Act is to stimulate the South African space industry. Therefore, SANSA will ensure that its contracting efforts are tailored to stimulate the private industry for the benefit of the country. This will entail setting clear private company outsourcing targets. The industries to be targeted are both in the space technology development sectors and the Earth observation value-adding services. SANSA's target for the SME industry contracting for 2016/17 was R12 million with increase in support to 13 Million in 2017/18.

Contracting value to public and private space industry

To meet SANSA's mandate of stimulating the space industry as a whole, the Agency will ensure that there is significant contracting of the space industry. Space, by its nature, is high risk and globally relies heavily on government as the anchor client for the national space industry of a particular country. SANSA, as the lead implementer of the space programme, has to provide the necessary anchor to the local space industry. This requires ensuring steady contracting to provide the base work to keep the industry going. The targeted broad industry contractual spend is R65 million over the five year period. Support for these industries and the embedded small medium enterprises will be through mechanisms such as the DST led Technology Localisation Programme (TLP), which spearheads the improvement of the technological capability of local firms leading to increased competitiveness (quality, cost, customisation), expanding capabilities (new products, services) and expanding into new markets both locally and globally.

The priorities for the year are:

- Further development of EO-Sat1
- Engagement with users on EO-Sat1 system deliverables
- Establishing a Calibration and Validation centre of expertise with various local partners
- Developing a business case on Houwteq as a national AIT facility
- Developing a technology roadmap to support the South African Space industry
- Establishing areas of competence and Expertise within the Technology framework with the various institutions in South Africa,
- Reviewing the current state of training in the local space industry,
- Conducting an analysis of the current global spacecraft ground support market and the South African competitive position as a service provider in order to develop a clear metrics for market share; and
- Developing the ***2030 South African Space Industry Growth Plan*** based on the NSP.

Strategic Goal 7: Transform SANSA into a high performance Agency

The Programme will pursue a transformation agenda in terms of staff and students. The satellite build programme will be used to achieve this through focused recruitment and retention strategies.

Programme Performance Outputs 2017/18

Space Engineering Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 3: Develop national human capacity and ensure transformation	S3.2 Support students with a transformation agenda	M3.2 The number of supported PDI students for formalised training (This excludes short courses and focuses on students that are registered for some formal training for a degree, diploma, a or certificate within the South African National Qualification Framework)	PDI Target: 8	6	8	8	8.
			Total Students: 10	8	10	10	10
			PDI Proportion: 80%	75%	80%	80%	80%
Goal 4: Enhance the competitiveness of the South African space industry	S4.2 Grow the national space industry	M4.2.1 The number of direct jobs supported externally through SANSA programme contracting	T4.2.1 A total of 55 direct jobs supported per year externally through SANSA programme contracting	55	55	55	55
		M4.2.2 The achievement of key project milestones in the EO-Sat1 development	Preliminary Design Review (PDR) completed for the Space System in preparation for Critical Design review in 2018/19 (Progressive Quantitative target)	EO-Sat1 System level 6 PDR (Preliminary Design Review completed)	SpaceTeq Satellite Level 5 PDR (Preliminary Design Review completed)	Data and Control Ground Segment Level 5 PDR Preliminary Design Review	Structural Thermal Model Assembly completed

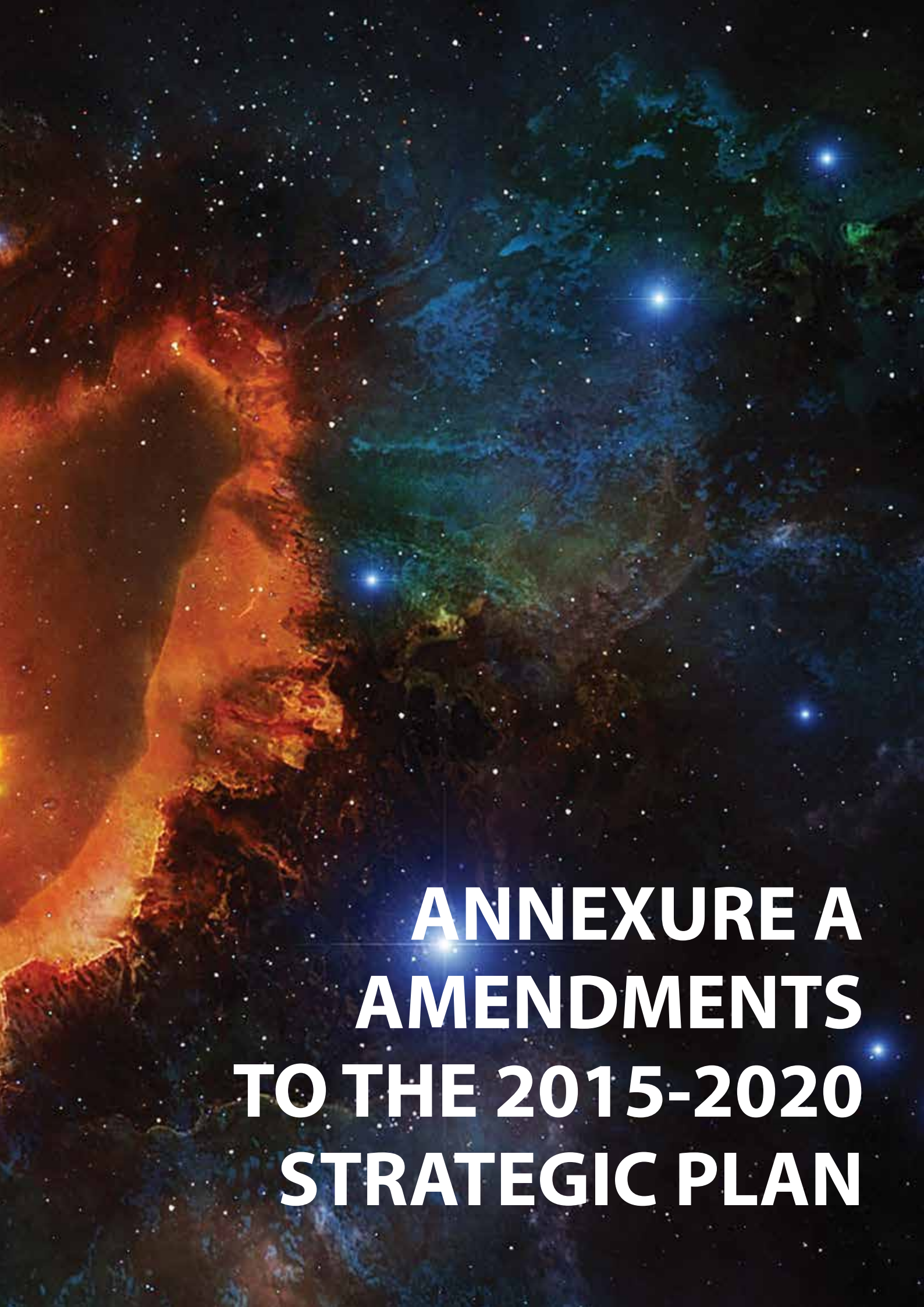
Space Engineering Programme				Quarterly Targets			
Strategic Goal	**Strategic Objective**	**Key Performance Indicator/ Measure**	**Annual Target**	**Q1**	**Q2**	**Q3**	**Q4**
Goal 4: Enhance the competitiveness of the South African space industry		M4.2.3 The total contract expenditure to SMEs for core space projects	R13 million	R3.2 million	R3.3 million	R3.3 million	R3.3 million
		M4.2.4 The total contract expenditure to the broad space related industry for core space projects	R65 million	R16.3 million	R16.3 million	R16.3 million	R16.3 million
Goal 7: Transform SANSA into a high performance Agency	S7.2.Ensure that SANSA has been optimised for high performance	M7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades	PDI employees (D-F grades): 8	5	5	5	5
			Total employees (D-F grades): 13	6	6	6	6
			Proportion: 60%	80%	80%	80%	80%
		M.7.3 1% of investment into staff training & development against operating expenditure.	Training and Development Expenditure: R134 310	R33 578	R33 578	R33 578	R33 578
			Total Operating Expenditure: R13 million	R3.3 million	R3.3 million	R3.3 million	R3.3 million
			Proportion: 1%	0.25%	0.25%	0.25%	0.25%

Space Engineering Programme Resource Considerations

Space Engineering Programme Expenditure

Space engineering	Audited Outcome			Approved budget	Medium Term Expenditure Framework			Total MTEF
Rand thousand	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	
Ring fenced grant	27 572	56 978	91 387	102 653	114 681	12 657	13 366	**140 704**
Current payments								
Compensation of employees	3 000	4 156	10 420	11 246	9 092	9 765	10 488	29 345
Goods and services	556	3 900	4 395	3 828	4 338	-	-	4 338
Payements for capital assets	24 016	48 922	76 573	87 579	101 251	2 892	2 878	107 021
Total Expenditure	**27 572**	**56 978**	**91 387**	**102 653**	**114 681**	**12 657**	**13 366**	**140 704**

The satellite build programme has an allocation of R140 million over the medium term. About 96% of the programme costs are towards the satellite build programme. The decrease in allocation in the outer years from 2018/19 results from the current approved funding of R450 million allocated at the inception of the satellite build programme in 2011, reaching its ceiling of R450 million in 2018/19. Funding for the continuation of the programme is yet to be confirmed.



ANNEXURE A AMENDMENTS TO THE 2015-2020 STRATEGIC PLAN

ANNEXURE A – Amendments to the 2015-2020 Strategic Plan

INTRODUCTION

The Framework for Strategic Plans and Annual Performance Plans states, "A Strategic Plan may be changed during the five-year period that it covers. However, such changes should be limited to revisions related to significant policy shifts or changes in the service-delivery environment. The relevant institution does this by issuing an amendment to the existing plan, which may be published as an annexure to the Annual Performance Plan, or by issuing a revised Strategic Plan."

The 2015-2020 SANSA Strategic Plan was implemented for the first time in 2015/16 and in the process of implementation and due to comments from the auditors, it became necessary to modify some of the KPIs and make sure that they are SMART and clear. Listed below are the modifications that have been implemented in red. Furthermore, given the financial constraints, the Agency has scaled down on some of the 2017/18 targets. The changes in the targets are also indicated in red below.

MODIFICATIONS TO MEASURES OR KPIs MODIFICATIONS TO TARGETS

Strategic Goal	Original	Modification	2017/18 Original	2017/18 Target
Goal 1: Address South Africa's challenges through space services and products	M1.1 Number of national high-impact products and applications	M1.1 Number of national high-impact products and services (modification implemented 2016/17)	Four national high-impact products and services	Five national high-impact products and services
	M1.2 The number of government decision or policy support tools	M1.2 The number of government decision support or policy tools	Two policy tools for government	Three policy tools for government
Goal 2: Lead high-impact collaborative R&D on a national scale	M2.1 The national research productivity score for space supported R&D	M2.1 The national research productivity score for space supported R&D (This productivity score is based on a function of research funding sourced + publications (journals, books, reports, proceedings) + students graduated + research rating status.) (modification implemented 2016/17)	1500	1500
Goal 3: Develop national human capacity and ensure transformation	M3.1 Number of youth directly engaged	M3.1 Number of youth directly engaged through science awareness & outreach activities (This excludes arms-length engagement with the youth e.g. a visit to one of SANSA's exhibition stands) (modification implemented 2016/17)	12000	12000
	M3.2 Number of students and interns supported for formalised training	M3.2 The proportion of supported PDI students for formalised training (This excludes short courses and focuses on students that are registered for some formal training for a degree, diploma, or certificate within the South African National Qualification Framework) (modification to be implemented 2017/18)	70	70

Strategic Goal	Original	Modification	2017/18 Original	2017/18 Target
Goal 4: Enhance the competitiveness of the South African space industry	M4.1.1. Successful satellite pass monitoring rate for Earth Observation	M4.1.1: Successful satellite pass monitoring rate of 98% per year for Earth Observation by end 2020 (modification to be implemented 2017/18)	99%	98%
	M4.1.2 Total income generated per year from space operations activities	M4.1.2: Total commercial income of R267 million by year end March 2020 (modification to be implemented 2017/18)	R65 million	R44 million
	M4.1.3 The total of space operations income invested in other SANSA programmes	M4.1.3: The proportion of space operations commercial international income invested in other SANSA programmes (modification to be implemented 2017/18)	R12 million	5%
	M4.2.1 The number of direct jobs supported externally through SANSA programme contracting	M4.2.1 A total of 55 direct jobs supported per year externally through SANSA programme contracting (modification to be implemented 2017/18)	100	55
	M4.2.2 The progress status on the EO-Sat1 development project	M4.2.2 The achievement of key project milestones in the EO-Sat1 development (modification to be implemented 2017/18)	75%	Preliminary Design Review (PDR) completed for the Space System in preparation for Critical Design review in 2018/19
	M4.2.3 The total contract expenditure to SMEs for core space projects	M4.2.3 The total contract expenditure to SMEs for core space projects	R13 million	R13 million
	M4.7 The total contract expenditure to the broad space related industry for core space projects	M4.2.4 The total contract expenditure to the broad space related industry for core space projects	R61 million	R65 million
Goal 5: Develop active global partnerships	M5.1 The equivalent revenue generated through partnerships as a proportion of the SANSA revenue	M5.1 The equivalent revenue generated through partnerships as a proportion of the SANSA non-commercial operating revenue (modification implemented 2016/17)	7%	3%

Strategic Goal	Original	Modification	2017/18 Original	2017/18 Target
Goal 6: Ensure the growth and sustainability of SANSA	M6.1 Total SANSA Income	M6.1 Total non-ring-fenced SANSA revenue (modification implemented 2016/17)	R251 million	R251 million
	M6.2 Estimated monetised impact per annum	M6.2Estimated monetised impact of space related activities (modification implemented 2017/18)	R120 million	Conduct inventory/ investigation of space related activities and their impact
	M6.3 SANSA's public value awareness	M6.3 SANSA's stakeholder awareness (modification to be implemented 2017/18)	70%	70%
	M6.4. High-level NSP implementation progress status.	M6.4. High-level NSP implementation progress status.	50%	50%
Goal 7: Transform SANSA into a high performance Agency	M7.1 Implementation of identified initiatives that enhance organisational performance	M7.1 Implementation of identified initiatives that enhance organisational performance	4	4
	M.72 Proportional (%) representation of permanent staff from designated groups in the top two management levels (manager, senior manager.)	M.7.2 Proportional (%) representation of permanent staff from designated groups in the D to F grades (modification implemented 2016/17)	65%	75%
	The KPI alongside is totally new and is intended to measure SANSA's investment in its staff.	M.7.31% of investment into staff training & development against operating expenditure. (modification to be implemented 2017/18)	No target was previously set as the KPI is new.	1%

KEY PERFORMANCE INDICATORS[1]

Indicator title	T1.1. Number of national high impact products and applications
Short definition	The number of high-impact products/services (PS) delivered within any one of the following PS areas, (i) PS1-National Geospatial decision-support data products, (ii) PS2 - National land user Land-cover Base Information Layers, (iii) PS3 -Space weather services, (iv) PS4 - Magnetic technology services.
Purpose/importance	This is intended to demonstrate a sample of the products and applications that are impactful and delivered utilising space science know how, expertise and facilities.
Source/collection of data	Reports that document what has been achieved or produced including appropriate statistics for each product. Some of the specifics may include some or all of the following: **PS1** • Data collected • Mosaics produced • Data distributed • Data request statistics • Report on use & impact **PS2 –** for each of the base information maps provide • Confirmed orders for services/products • Frequency of production or publication of base maps • Distribution statistics • Industry contracts/agreement to deliver services/product • Report on use & impact • Online support information **PS3** • Industry contracts/agreement to deliver services/product • Confirmed orders for services/products • Report on use & impact **PS4** • Industry contracts/agreement to deliver services/product • Confirmed orders for services/products • Report on use & impact
Method of calculation	A brief qualitative report of the services/products that have been delivered will be used as the products/services are not a simple statistical/numerical activity. The report will also contain the means by which the impactful product/service was determined for this KPI.
System Used	Manual

1 Current KPI Reference Manual undergoing extensive review will be revised after consolidated consultation in the new FY.

Indicator title	T1.1. Number of national high impact products and applications
Description of KPI reporting activities	Compilation of detailed products/service reports. Recording of any activities/ events, that can be used for validation e.g. data transmission logs, client acceptance signatures, contract registers.
Means of Validation	Sample testing some of the assertions in the Product/Service report against some of the validation material e.g. data transmission logs, client acceptance signatures, contract registers.
Data limitations	The progress on the project is dependent on the proposed scope of work for the current year. Note that this data is limited to the satellite segment and the scope is determined by the available budget for the financial year
Type of indicator	Output and impact/ Progressive qualitative
Calculation type	Cumulative and progressive throughout the year.
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Deliver all five products/services as per APP
Desired Divisional performance	Earth Observation: Deliver three high-impact products/services Space Science: Deliver two high-impact products/services
Primary Senior Manager responsibility	MD:EO & MD:SS
Secondary Senior Manager Responsibility	MD:EO & MD:SS
Manager Responsibility	Earth Observation: DPS & DSM Space Science: AST & SRA

Indicator title	T1.2. Number of government decision or policy support tools
Short definition	The number of decision or policy support tools that SANSA will produce. These tools are intended to give decision or policy advisory information to key stakeholders, mainly government.
Purpose/importance	This is intended to provide government with decision support information or tools on space related issues. In 2016/17, 3 policy advisory briefs will be developed covering the following topics: (i) Urbanisation in selected major cities in South Africa; and (ii) Space weather impacts on aviation iii. Current state of the space industry in South Africa
Source/collection of data	The existence of the policy/briefs on the three selected topics
Method of calculation	SANSA policy paper/brief register
System Used	Manual
Description of KPI reporting activities	Policy paper/brief is produced and distributed and/or presented to relevant stakeholders. Policy paper/brief is entered into SANSA register
Means of Validation	Documents are tabled for approval by SMCO
Data limitations	None
Type of indicator	Output/ Progressive qualitative
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Three policy briefs
Desired Divisional performance	Earth Observation: One policy brief on urbanisation in selected major cities in South Africa Space Science: One policy brief on Space Weather Impacts on Aviation Space Engineering: One brief on the current state of the space industry in South Africa
Primary Senior Manager responsibility	MD:EO,MD:SS & ED: Space Programme
Secondary Senior Manager Responsibility	Earth Observation: RAD Space Science: SRA. Space Engineering
Manager Responsibility	Earth Observation: RAD Space Science: SRA. Space Engineering

Indicator title	T2.1. The national research productivity score for space supported R&D
Short definition	The research productivity score for R&D
Purpose/importance	This is meant to demonstrate SANSA's research output and is an indicator of research output, quality, impact and relevance

<table>
<tr><th>Indicator title</th><th>T2.1. The national research productivity score for space supported R&D</th></tr>
<tr><td>Source/collection of data</td><td>This productivity score is based on a function of research funding sourced + publications (journals, books, reports, proceedings) +
students graduated + research rating status
Each identified contributor to the score will earn points according to the table below:
Determination of points per contributing item
<table>
<tr><td>Publications</td><td>as separate calculation</td></tr>
<tr><td>Research Funding</td><td>as separate calculation</td></tr>
<tr><td>MSc Students graduated</td><td>20 per students</td></tr>
<tr><td>PhD Students graduated</td><td>60 per students</td></tr>
<tr><td>Technical reports</td><td>5 per report</td></tr>
<tr><td>Conference Proceedings</td><td>5 per proceedings</td></tr>
<tr><td>Whole Books</td><td>100 per book</td></tr>
<tr><td>Chapters in Books</td><td>15 per chapter</td></tr>
<tr><td>First time A rating</td><td>100 per researcher</td></tr>
<tr><td>First time other than A rating</td><td>50 per researcher</td></tr>
<tr><td>Improvement in rating</td><td>50 per researcher</td></tr>
<tr><td>Retention in rating</td><td>40 per researcher</td></tr>
</table>
Published papers in PDF and hard copy available. For books front pages available in pdf.
Grant funding listed in grant award registers, and award letters available - also available from finance system as grant income received. Only grant funding for research projects should be included – no student or science advancement funding.
Students graduated – list is maintained with PDF copies of degree award letters.
Research rating status – determined by rating award letters.</td></tr>
<tr><td>Method of calculation</td><td>Composite function as described in “determination of research productivity score” document</td></tr>
<tr><td>System Used</td><td>All evidence is kept in the KPI file,</td></tr>
<tr><td>Description of KPI reporting activities</td><td>Information is collected monthly on an ongoing basis, and collated and verified quarterly.</td></tr>
<tr><td>Means of Validation</td><td>Count the hard copies of publications and books in KPI File
Verify that evidence exists for all aspects included in the formula
Verify excel sheet with calculation</td></tr>
<tr><td>Data limitations</td><td>A composite score masks some of the key elements that are, in their own right, important for SANSA performance review e.g. number of publications, grant amount raised, number of graduates, number of rated researchers and their ratings. Therefore, it is important that data on these base elements is also kept and reported on in the main narrative of the report.</td></tr>
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Indicator title	T2.1. The national research productivity score for space supported R&D
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Achieve a research productivity score of 1500.
Desired Divisional performance	Earth Observation: Research productivity score contribution of 30% to the total SANSA score Space Science: Research productivity score contribution of 70%% to the total SANSA score
Primary Senior Manager responsibility	MD:EO & MD:SS
Secondary Senior Manager Responsibility	Earth Observation: RAD Manager and Chief Scientist Space Science: SRA
Manager Responsibility	Earth Observation: RAD Manager and Chief Scientist Space Science: SRA

Indicator title	T3.1. Number of youth directly engaged
Short definition	This refers to the number of young people engaged directly through some specific activity (e.g. visit by learners to a SANSA facility, learner workshop/lesson, SANSA visit to a school) and **will exclude a count of young people who visit SANSA stands at exhibits.**
Purpose/importance	To indicate the extent to which SANSA is promoting science and increasing awareness amongst young people
Source/collection of data	Hard copies of attendance register of activities PDF of attendance registers and summary.
Method of calculation	Manual calculation
System Used	Manual System
Description of KPI reporting activities	Attendance register is completed at the event and signed by external supervisor of the participating group. Number of attendees get captured into excel spread sheet
Means of Validation	Signed-off attendance registers
Data limitations	Omission of full details on register. Data would not reflect some of the demographics (race, gender) required by the PPC for example.
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Engage 12000 leaners
Desired Divisional performance	Earth Observation: Space Science: Space Operations:
Primary Senior Manager responsibility	MD:EO, MD:SS, MD:SO

Indicator title	T3.1. Number of youth directly engaged
Secondary Senior Manager Responsibility	Earth Observation: SAS Manager Space Science: SAU Space Operations: HR manager via the Science Advancement Practitioner
Manager Responsibility	Earth Observation: SAS Manager Space Science: SAU Space Operations: HR manager via the Science Advancement Practitioner

Indicator title	T3.2. Number of students and interns supported for formalised training
Short definition	The total number of students currently linked and supported by SANSA either through bursaries, supervised or on an internship. **SANSA employees who are supported under any SANSA staff development scheme should not be counted. Further this excludes short courses and focuses on degree-registered students only.**
Purpose/importance	This measures the level to which SANSA contributes to the development of external human capacity through formal degree training.
Source/collection of data	Contracts and student agreements & student records Proof of supervision engagement
Method of calculation	Manual head count. Since the academic year and financial year are different – students are added in the quarter in which they joined SANSA for that financial year. **That is, students/interns have to be counted once in the quarter in which they joined or began to be supported by SANSA.** So, students added in quarter 4 are new first time SANSA students for that academic year, and in quarter 1 of the new financial year a new count is done of all students supported at that time (April).
System Used	Excel Spreadsheet
Description of KPI reporting activities	All student contracts counted
Means of Validation	Contracts and student agreements, proof of student supervision contracts/register are available.
Data limitations	There is no distinction between students; the level of training is not indicated; demographics are not indicated. These are some of the demographics required by the DST and the PPC. Therefore, it is important that data on these base elements is also kept and reported on in the main narrative of the report.
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Target of 80%
Desired Divisional performance	Earth Observation : Space Science: Space Engineering:
Primary Senior Manager responsibility	MD:EO, MD:SS, ED: Space Programme;

Indicator title	T3.2. Number of students and interns supported for formalised training
Secondary Senior Manager Responsibility	Earth Observation: HR; Space Science: HR, Space Engineering: Administrator
Manager Responsibility	Earth Observation: HR; Space Science: HR, Space Engineering: Administrator

Indicator title	T4.1.1. Successful satellite pass monitoring rate for Earth observation
Short definition	The measurement of the rate of success in downloading SANSA EO data measured in proportional time achieved.
Purpose/importance	To measure the success rate of SANSA Space Operations in supporting SANSA Earth Observation. It is important to measure the effectiveness of this support given the internal contracting for these services between the two directorates. It also shows the impact of SANSA's space operations activities to EO.
Source/collection of data	1. Data acquired is calculated minutes of a pass or a fraction thereof. 2. Data losses are calculated in minutes or fractions thereof 3. Operational workload is calculated in passes per day
Method of calculation	Systematic count of minutes of data captured and demodulated
System Used	Daily passes requested from EO as per flight plan, SO data acquisition pass summary from QF and database entries
Description of KPI reporting activities	Operations manager totals the minutes from passes completed Operations manager completes KPI quarterly
Means of Validation	SO verifies with EO on quantity (minutes) and quality of data acquired
Data limitations	
Type of indicator	Output
Calculation type	Non-accumulative
Reporting cycle	Quarterly
New indicator	Not a new indicator
Desired SANSA performance	=>98%
Desired Divisional performance	=>98%
Primary Senior Manager responsibility	MD: SO
Secondary Senior Manager Responsibility	Space Operations: Operations manager
Manager Responsibility	Space Operations: Operations manager

Indicator title	T4.1.2.Total income generated from space operations activities
Short definition	The income generated by the Space Operations Programme for the financial year, includes all forms of income e.g. inter-company contractual revenue, external contracts, ring fenced grant income
Purpose/importance	This measures the revenue generation capacity of the Space Operations activities. This is important given the commercial emphasis of this programme.
Source/collection of data	This information is based on signed contracts and the actual financial transactions on the financial system and reported numbers on the financial statements.
Method of calculation	This would be the total of all the contractual revenue generated under the space operations programme.
System Used	Financial systems
Description of KPI reporting activities	Generate income financial statement from the ERP system Cross reference with contracts received & invoices issued & grant awards Cross reference with income contract spreadsheets Market-to- meter
Means of Validation	Contracts with the clients and invoices
Data limitations	The value does not give an indication of the different sector income streams. Such information would give SANSA the necessary intelligence for making strategic choices. Therefore, information on the different income streams should be kept and reported in the report narrative.
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	Yes
Desired SANSA performance	Target of R44 million
Desired Divisional performance	R44 million
Primary Senior Manager responsibility	MD:SO
Secondary Senior Manager Responsibility	Space Operations: Finance manager
Manager Responsibility	Space Operations: Finance manager

Indicator title	T4.1.3.Total amount of space operations money invested in other SANSA programmes
Short definition	This measures the level to which the Space Operations Programme provides support to all the SANSA programmes and hence contributes to the **primary public** mandate of SANSA.
Purpose/importance	The primary mandate of SANSA is to provide public benefits. Therefore, it is important to show that in addition to the commercial activities, the space operations programme directly or indirectly (in-kind) supports the other programmes and hence has a public mandate contribution.
Source/collection of data	Quantification of the cross-subsidisation of the other programmes. This could be in the form of actual cross-subsidy money, services provided at no cost, or services provided at a discounted cost when compared to what it would cost to provide similar services to an **external South Africa client** (not international client). This will beobtained from costing and pricing.
Method of calculation	Total of all the subsidy amounts (direct or in-kind)
System Used	Manual count / as per internal requests/ as per project plan
Description of KPI reporting activities	C= Accurate costing and charge for all services provided P= Accurate pricing of the services for an **external South African client i.e. external client in South African conditions.** Calculate discounted amount that will then be equivalent to the in-kind/direct subsidy (S) amount. S=P-C
Means of Validation	Contracts and service level agreements and the associated transactional amounts
Data limitations	Inaccuracies in the costing and pricing structures. Currently SANSA does not have a clear costing and pricing framework.
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	Yes
Desired SANSA performance	Target is 5%
Desired Divisional performance	5%
Primary Senior Manager responsibility	MD:SO
Secondary Senior Manager Responsibility	CFO, MD:EO
Manager Responsibility	Space Operations: Finance manager Earth Observations: Finance Manager

Indicator title	T4.2.1.The number of direct jobs supported externally through SANSA programme contracting
Short definition	Number of personnel employed full time on the EO-Sat1 Programme, either by the main contractor or subcontractors.

Indicator title	T4.2.1.The number of direct jobs supported externally through SANSA programme contracting
Purpose/importance	Indicates the number of opportunities being offered to the space industry in the country. One of the objectives of the Economic Competitiveness Support Programme (ECSP) is to create jobs. However, SANSA outsources the bulk of the work in line with government's decision that the satellite build programme should be done in partnership with Denel. Further, the SANSA Act mandates SANSA to stimulate the national space industry. Therefore this KPI measures the extent to which these two objectives are met.
Source/collection of data	Signed reports issued by the contractors to whom the work is contracted.
Method of calculation	Summation of all the jobs being occupied by contractor and subcontractor personnel on this Programme
System Used	Manual
Description of KPI reporting activities	At the moment, a single report exists: "Industry Development & Localisation Management Plan", by Denel Dynamics, from where the information is extracted This report is issued quarterly
Means of Validation	Verification of information with the main contractor/subcontractor on a regular basis
Data limitations	Given that some of the external employees do not solely focus on the SANSA contracted programmes, a more accurate count is not employee numbers but rather employee Full Time Equivalents (FTE). Therefore, going forward SANSA has to find ways of refining this metric. Currently this KPI does not measure employee demographics which information is required by the DST and the PPC. Therefore, this information has to be collected and recorded and presented in the narrative of the report.
Type of indicator	Output
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	No
Desired SANSA performance	Total of 55 jobs supported
Desired Divisional performance	SPD: 55 jobs supported
Primary Senior Manager responsibility	ED: SP
Secondary Senior Manager Responsibility	Space Programme Manager
Manager Responsibility	Strategy and Planning Manager

Indicator title	T4.2.2.The progress status on the EO-Sat1 development project
Short definition	This indicator establishes the technical progress accomplished when compared to the full development cycle and schedule of the project
Purpose/importance	This is to measure the progress that is being made in the development of EO-Sat1 and allow for any remedial actions to be taken proactively to ensure the timely completion of the project.
Source/collection of data	Original programme schedule, and latest programme schedule. Tracking of progress against key milestones.
Method of calculation	Compare the key defining points as part of the project lifecycle model with respect to the proposed schedule. These defining points are the (PDR, CDR, FAR, etc).
System Used	Manual
Description of KPI reporting activities	A "EO-Sat1 Programme/Project Progress Report" is produced monthly and presented to the Space Acquisition Executive Committee (SAEC). On a quarterly basis this report is summarised to represent the important events of the previoius quarter and presented to the Board Strategy and Investment Committee Meeting. On approval, the report is escalated to the Board.
Means of Validation	Comparison of latest programme schedule against the original programme schedule
Data limitations	Limitations are defined by the resource constraints available on the implementation of the project.
Type of indicator	Output : Measures scheduled performance
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	No – Established indicator
Desired SANSA performance	Qualitative measure of completing various key defining points as per lifecycle model.
Desired Divisional performance	As Above
Primary Senior Manager responsibility	ED:SP
Secondary Senior Manager Responsibility	Senior technical Manager
Manager Responsibility	SPD: Programme Manager

Indicator title	T4.2.3. The total contract expenditure to SMEs for core space projects
Short definition	The KPI measures the contract value that is outsourced to **Small to Medium Enterprises (SMEs)** for all SANSA programmes including EO, SS, SO and SE programmes, in the main SE. **This should include the component that Denel outsources to SMEs as part of the EO-Sat1 project. This should exclude the EO-Sat1 money spent within Denel. This should not include consultancy expenditure for general support initiatives.**
Purpose/importance	This measures the extent to which SANSA is supporting SMEs through its core space projects.
Source/collection of data	Internal contracts and invoices and auditable reports from the supported companies, such as Denel.
Method of calculation	Manual
System Used	Contract register and financial system

Indicator title	T4.2.3. The total contract expenditure to SMEs for core space projects
Description of KPI reporting activities	Quarterly
Means of Validation	Invoices
Data limitations	Accuracy in classifying which companies are SMEs and which are not. This information is dependent on the annual turnover of the relevant company and this information is not necessarily readily available.
Type of indicator	Input
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	Yes
Desired SANSA performance	A total of R13 million to be outsourced to SMEs this financial year.
Desired Divisional performance	Space Engineering: Earth Observation:
Primary Senior Manager responsibility	ED: SP
Secondary Senior Manager Responsibility	Senior technical Manager
Manager Responsibility	Earth Observation: Stakeholder and Finance manager

Indicator title	T4.2.4.Total contract expenditure to the broad space - related industry for core space projects
Short definition	The KPI measures the contract value that is outsourced to **Small to Medium Enterprises (SMEs) and big industry players (This should not include consultancy expenditure for general support initiatives).**
Purpose/importance	This is a true measure of the capital invested in re-establishing the space industry in South Africa
Source/collection of data	Internal contracts and invoices and auditable reports from affected companies.
Method of calculation	Manual
System Used	Contract register and financial system
Description of KPI reporting activities	Quarterly: The Contracts Manager must keep an updated account of all funds invested, per contract, in industry. This is to be reported in the quarterly report every quarter
Means of Validation	Invoices: The Contracts Manager will compare his figures against those held by Finance before releasing his numbers to the quarterly report
Data limitations	SANSA can only report on the funds expended on Programmes under its control
Type of indicator	Input: Broader impact on space industry
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	This is an existing but modified indicator
Desired SANSA performance	A total of R65 million to be contracted to the broader space industry this financial year.
Desired Divisional performance	As above
Primary Senior Manager responsibility	ED: SP
Secondary Senior Manager Responsibility	Senior technical Manager
Manager Responsibility	Contracts Manager SPD

Indicator title	T5.1. The equivalent revenue generated through partnerships as a proportion of the SANSA revenue
Short definition	Quantified monetary and in-kind benefit value generated by SANSA through its global partnerships in relation to the non-commercial Programme operating revenue. The comparative revenue excludes the EO-Sat1 funding which is not spent directly within SANSA. This KPI quantifies the proportion of the actual money transacted and the in-kind benefit that SANSA has gained in relation to its non-commercial Programme operating revenue. The partnership revenue being considered includes personnel benefit; training benefit; subsistence and travel benefit; equipment benefits; and any other partnership estimated monetary value generated and accrued through in-kind/direct benefits to SANSA. This excludes strict commercial contracts like the SO commercial contracts and other direct (client-service provider) contracts that are not of a mutual partnership kind.
Purpose/importance	To demonstrate the value generated through national and international partnerships in relation to the non-commercial operating programme revenue.
Source/collection of data	Projects, partnership agreements, MoUs, contracts, equipment hosting agreements – any relevant evidence of the value of the contribution from a national or international partner.
Method of calculation	Identify suitable contributions made by global partnerships where value accrued to the specific Programme. Quantify the contributions made by international partners. Where in-kind benefit is claimed justifiable estimates have to be made largely based on what it would have cost the specific programme to pay for the service or product. e.g. the estimate it would cost the Programme to pay for a visiting researcher of that calibre; cost to run a particular course. All costs have to be contextualised to the South African context. That is, as an example, a visiting researcher's value should be based on SANSA's pay scales for that level of researcher and not the actual pay scale of that researcher back home converted into Rands.
System Used	Manual calculation in excel spreadsheet
Description of KPI reporting activities	Describe and document where value accrued to SANSA through partnerships. Calculate equivalent value from partnerships. Compute this value as a percentage of the total revenue for SANSA.
Means of Validation	Partnership agreements and contracts. Justifiable estimates and related calculations.
Data limitations	Some of the value is based on estimations. Inconsistencies in the definition may result in inaccuracies. A limitation may lie in the documenting of the in-kind benefits from global partnerships.
Type of indicator	Financial output
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	Partnership revenue amounts to 3% of the SANSA revenue (excluding EO-Sat1 revenue that is contracted out).
Desired Divisional performance	Earth Observation : ZAR Space Science: ZAR
Primary Senior Manager responsibility	CEO
Secondary Senior Manager Responsibility	MD: EO and MD: SS

Indicator title	T5.1. The equivalent revenue generated through partnerships as a proportion of the SANSA revenue
Manager Responsibility	MD's

Indicator title	T6.1.1. Total SANSA income
Short definition	The total revenue generated by SANSA during the financial year, includes all forms of revenue income (core grant, external contracts, grant income, other assorted income)
Purpose/importance	This KPI demonstrates SANSA's move towards financial sustainability.
Source/collection of data	Financial statements of income revenue received by financial year end
Method of calculation	Financial reporting of total revenue for financial year
System Used	ERP/Manual
Description of KPI reporting activities	Generate income financial statement from the ERP system Cross reference with contracts received & invoices issued & grant awards. Cross reference with income contract register and grant register
Means of Validation	Audited financial statements
Data limitations	None
Type of indicator	Input
Calculation type	Cumulative
Reporting cycle	Annual
New indicator	Yes
Desired SANSA performance	Total revenue of R251 million
Desired Divisional performance	Earth Observation: Space Science: Total revenue of ZAR l Space Operations: SPD: Administration:
Primary Senior Manager responsibility	CFO
Secondary Senior Manager Responsibility	ALL
Manager Responsibility	All Finance Managers

Indicator title	T6.1.2. Estimated monetised impact per annum
Short definition	This is an indicator that seeks to quantify the public/economic value generated by key SANSA projects. In the main the quantification will focus on the value generated through the four high-impact products and services, namely, (i) PS1-National Geospatial decision-support data products, (ii) PS2 - National land user Land-cover Base Information Layers, (iii) PS3 -Space weather services, (iv) PS4 - Magnetic technology services. Not all of these projects will be quantified collectively given the complexity of the analysis.
Purpose/importance	This is to estimate the return on SANSA's investment and the so-cio-economic impact the space programme is making nationally. The value and benefit of space is currently not fully appreciated. This KPI seeks to begin to put in place a means of quantifying this value.
Source/collection of data	The data has to be collected from various sources including internal SANSA records and global benchmarks.
Method of calculation	Assessing socioeconomic value uses either an analytic approach or impact assessment approach. One of four impact assessment methods may be used depending on various factors including whether or not the project products are being used, the availability of data to quantify project impacts, the availability of decision makers or domain experts to provide expert or user input.
System Used	Manual
Description of KPI reporting activities	Selection of the approach to be applied. Search for the relevant data and perform the analysis.
Means of Validation	Testing the validity of the approach.
Data limitations	The data is based on intelligent assumptions and is dependent on various factors. Further the value is based on potential use and not on actual use. For instance, the value of the disaster management prod-ucts can only be realised and quantified if a disaster actually occurs.
Type of indicator	Output
Calculation type	Cumulative within each year
Reporting cycle	Annual
New indicator	Yes
Desired SANSA performance	On hold
Desired Divisional performance	Estimate the return on SANSA's investment and the socio-economic impact the space programme is making nationally.
Primary Senior Manager responsibility	CEO
Secondary Senior Manager Responsibility	EO & SS MDs & CFO
Manager Responsibility	PM&E Manager

Indicator title	T6.1.3. SANSA's public value awareness
Short definition	Determine the level of service awareness of SANSA amongst public sector stakeholders
Purpose/importance	Stakeholders are key to influencing and supporting SANSA programmes and lack of understanding or awareness of SANSA's offering and services will impact on SANSA's sustainability and success. The primary purpose is to assess the level of awareness that potential and existing stakeholders have of the product/service offering of SANSA.
Source/collection of data	Electronic survey
Method of calculation	Awareness ratio
System Used	Electronic survey platform
Description of KPI reporting activities	Development and distribution of survey Accumulation of responses Reporting of responses
Means of Validation	Electronic report generated by system
Data limitations	Unlike face-to-face interviews, electronic surveys have inherent limitations related to misinterpretation of what is being enquired. Another limitation could be low response rates. SANSA services a wide scope of stakeholders and designing a questionnaire that adequately addresses all pertinent aspects of stakeholder public value awareness will be challenging.
Type of indicator	Output
Calculation type	Once off
Reporting cycle	Per semester
New indicator	Yes
Desired SANSA performance	70% service/product offering awareness
Desired Divisional performance	35% response with 35% service/product offering awareness
Primary Senior Manager responsibility	CEO
Secondary Senior Manager Responsibility	MDs: EO & SS
Manager Responsibility	Corporate Communications Manager

Indicator title	T6.2. High-level NSP implementation progress status
Short definition	This indicator indicates whether identified NSP projects are being implemented
Purpose/importance	Implementation of these projects is important as it indicates progress made since the development of the NSP
Source/collection of data	Implementation Reports or feedback from relevant participants - Assessment dashboard system
Method of calculation	Qualitative
System Used	Manual
Description of KPI reporting activities	Assessing the activity level of each of the defined NSP projects
Means of Validation	Comparison of original project status with the latest project status
Data limitations	Defining what the benchmark for an implemented NSP project is.
Type of indicator	Activity indicator
Calculation type	Cumulative
Reporting cycle	Annually
New indicator	Yes
Desired SANSA performance	Assessment of the activity levels of projects
Desired Divisional performance	50%
Primary Senior Manager responsibility	CEO
Secondary Senior Manager Responsibility	Stakeholder Liaison Specialist
Manager Responsibility	Stakeholder Liaison Specialist

Indicator title: T7.1. 1. Implement identified initiatives that enhance organisational performance	
Short definition	This is a qualitative indicator that indicates whether identified initiatives have happened
Purpose/importance	The indicator is action focused and is important in that implementation of the initiatives is intended to enhance organisational performance
Source/collection of data	Implementation reports
Method of calculation	Qualitative indicator
System Used	Qualitative reporting
Description of KPI reporting activities	Initiative 1:Develop and administer employee engagement survey Initiative 2: Investment in employee development Initiative 3: Establishment and maintenance of good and long-term relationships with all stakeholders Initiative 4: Financial sustainability programme
Means of Validation	Verification of the validity of the reports
Data limitations	N/A
Type of indicator	Measures activities and outputs
Calculation type	N/A
Reporting cycle	Annual
New indicator	New
Desired SANSA performance	Four initiatives

Indicator title: T7.1. 1. Implement identified initiatives that enhance organisational performance	
Desired Divisional performance	Implementation of the initiatives to enhance SANSA's performance
Primary Senior Manager responsibility	ED: Corporate Services, CFO & Stakeholder Liaison Specialist
Secondary Senior Manager Responsibility	HR Manager
Manager Responsibility	ED

Indicator title	T7.1.2. Proportional (%) representation of permanent staff from designated groups in the D to F grades
Short definition	The proportional representation of designated groups in the D to F grades of SANSA.
Purpose/importance	This KPI measures the level of transformation of SANSA at the D to F grade level
Source/collection of data	• • Employment Equity Report
Method of calculation	According to EE: Designated groups refer to Africans, Coloureds, Indians, Females and people with disabilities. Designated individuals (PDI) in the D to F grades have to be counted and expressed as a proportion of the total staff in the D to F grades (Total) P=PDI/Total
System Used	HR System and database
Description of KPI reporting activities	Accurate records have to be kept and updated every month. Each division has to keep accurate records and these have to be consolidated monthly at the Corporate Office.
Means of Validation	Approved grades and signed off statistics.
Data limitations	Inaccuracies in the grades for individuals would contaminate the data. Therefore, it is crucial that the grades are accurate.
Type of indicator	Output and Equity
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	No
Desired SANSA performance	A target of 75% representation of designated individuals.
Desired Divisional performance	Space Science: 55% Earth Observation: 80% Space Operations: 65% Corporate: 80% Space Engineering:80%
Primary Senior Manager responsibility	ED: Corporate Services
Secondary Senior Manager Responsibility	MD:EO, MD:SS and MD:SO
Manager Responsibility	Space Science: HR, Earth Observation HR, Space Operations: HR Corporate: HR

Indicator title	T7.1.2. Proportional (%) of investment into staff training & development against operating expenditure
Short definition	Proportional (%) of investment into staff training
Purpose/importance	This KPI measures investment of staff training & development
Source/collection of data	Financial statements
Method of calculation	Financial reporting of total revenue for financial year
System Used	Finance system
Description of KPI reporting activities	Accurate financial statements have to be kept and updated every month.
Means of Validation	Audited Financial statements
Data limitations	None
Type of indicator	
Calculation type	Cumulative
Reporting cycle	Quarterly
New indicator	Yes
Desired SANSA performance	1%
Desired Divisional performance	Space Science: 1% Earth Observation: 1% Space Operations: 1% Corporate:1% Space Engineering:1%
Primary Senior Manager responsibility	CFO
Secondary Senior Manager Responsibility	MD:EO, MD:SS, MD:SO and MD:SE
Manager Responsibility	Space Science: Earth Observation Space Operations: Corporate: Space Engineering:

REFERENCES

1. Science Councils and NSI Reports
2. South African Government Reports and Plans
3. The Space Report 2015: **The Authoritative Guide to Global Space Activity**
4. The Space Report 2016 **"The Authoritative Guide to Global Space Activity"**, Space Foundation
5. Satellite Industry Association 2016 **"State of Satellite Industry Report, June 2016"**, The Tauri Group

(Footnotes)

1. This goal is dependent on many factors including receiving funding from grants, participation in schools and the availability of funding to attend festivals etc. Because of the many variables involved in this we tend to see the same trend as with Goal T2.1, with some years recording an overachievement and other years recording an underachievement. Although the agency will overachieve in 2016/17, the target set for 2017/18 is 12000 learners, which is a more realistic target and should remain the target as SANSA is saturated at the level at which learners can be engaged given the constraints on budget, the limited resources, and the competitiveness for science advancement funding. The total numbers have thus been reduced.
2. Change in pass definition: Prior to 2016/17 the definition of a pass included the number of scenes per pass therefore the high number of "passes". In reality, a pass can consist of a number of scenes. The effort behind downloading data relates to a pass irrespective of the amount of scenes thus the change of the metric to better reflect on the effort. The number of passes was estimated by interrogating the portfolio of satellites required to be tracked in order to achieve the goals in the EO domain.
3. The original 326MR includes the internal revenue from SANSA EO. The updated budget excludes this income. The opportunity was used to do a refinement of the predicted income. Due to the nature of income fluctuation at SANSA Space Operations (income consists of both fixed income from clients and a variable portion related to the launch market) is was decided to take a conservative approach based on current forecast of the launch market.
4. SANSA Space Operations has significant operating cost, over and above manpower cost. This is due to the nature of the service. Thus, the available funds for investment is modest compared to the income. Additionally SANSA Space Operations re-invests most of its surplus into the upgrade and expansion of its infrastructure in order to remain competitive in the commercial environment within which it operates. Investing 5% of its external income is hence an achievable target without jeopardising Space operations capability to perform its service.
5. The indicator has been changed
6. The NSP has not yet been approved. SANSA continues to implement some of the programmes under the directive of the DST.

NOTES:

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